A CHILTON PUBLICATION

the Iron Age

E NATIONAL METALWORKING WEEKLY

January 17, 1952

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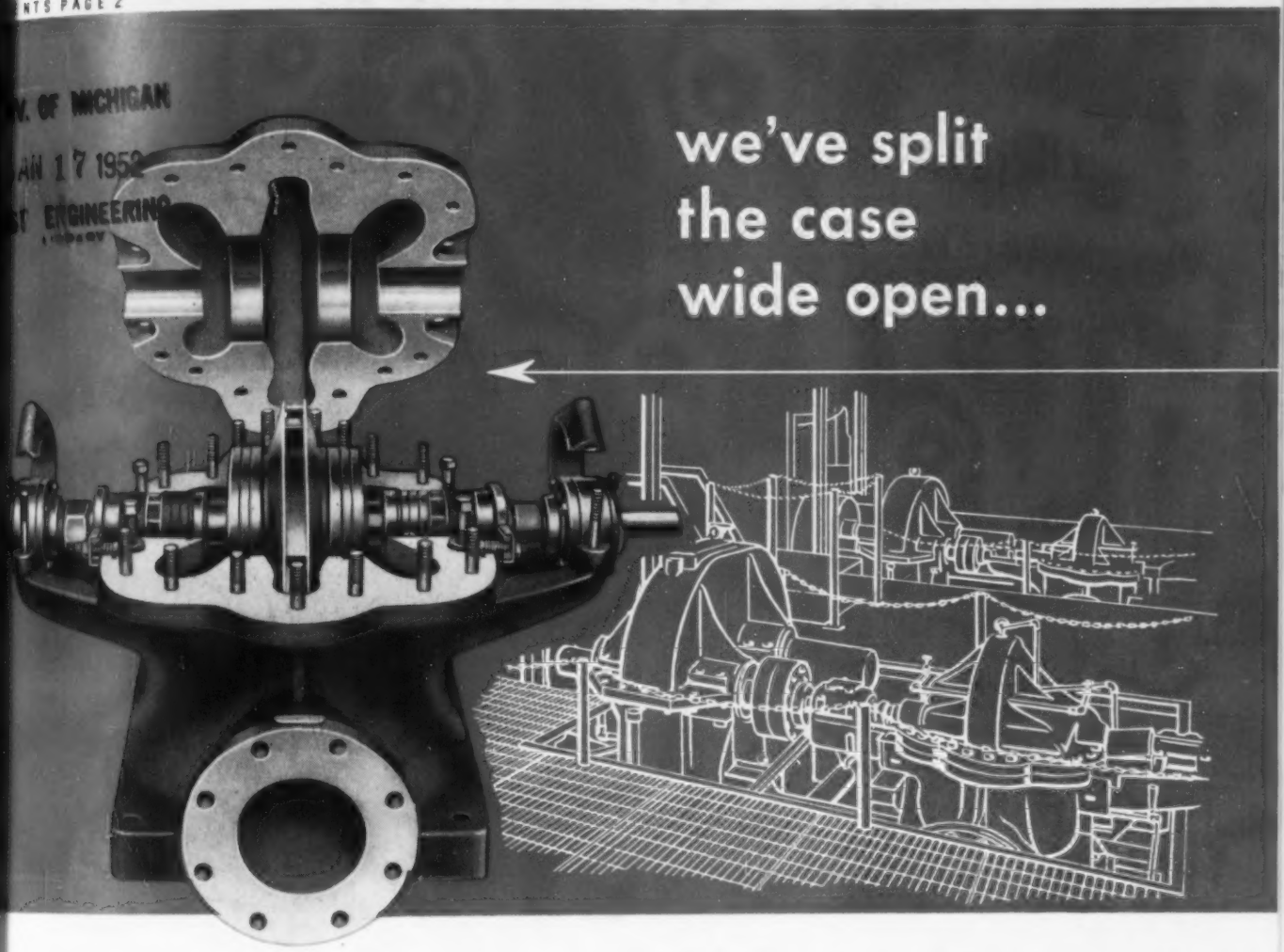

...for proof of **better pumping performance!**

We've lifted the casing of a Fairbanks-Morse Single-Stage Split-Case Centrifugal to show you why you get *better* performance . . . *lower* maintenance costs with Fairbanks-Morse.

Note the sturdy construction and exceptional strength provided by the arched casing and solid pump base . . . the ease with which the entire pump can be inspected or the entire rotating element removed without disturbing driver or pipe connections. Smooth, one-piece impeller reduces wear and maintains efficiency. Impeller is pressed on shaft over a key so that the key also drives the shaft sleeves and prevents destructive rotation of the sleeve on the shaft. Removable casing and impeller wearing rings assure easy maintenance and have streamlined water guiding surfaces for maximum pump efficiency.

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GENERATORS • LIGHT PLANTS • DIESEL,
DUAL FUEL AND GASOLINE ENGINES

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FOR . . .

"Facts on Duplexing"

Write for this Bulletin today!

Here are the answers to many foundry problems—particularly those due to inferior coke and low grade scrap! "Facts On Duplexing," Whiting's new bulletin, gives suggestions on how to improve existing duplexing systems and how to establish efficient, new duplexing arrangements to meet specific needs.

Duplexing is today's most effective method for increasing metal yield—for uninterrupted cupola production and a reservoir of hot metal that makes possible continuous pouring—for precise analysis and temperature control—for fewer machine shop rejections, and for fine grain, high strength castings.

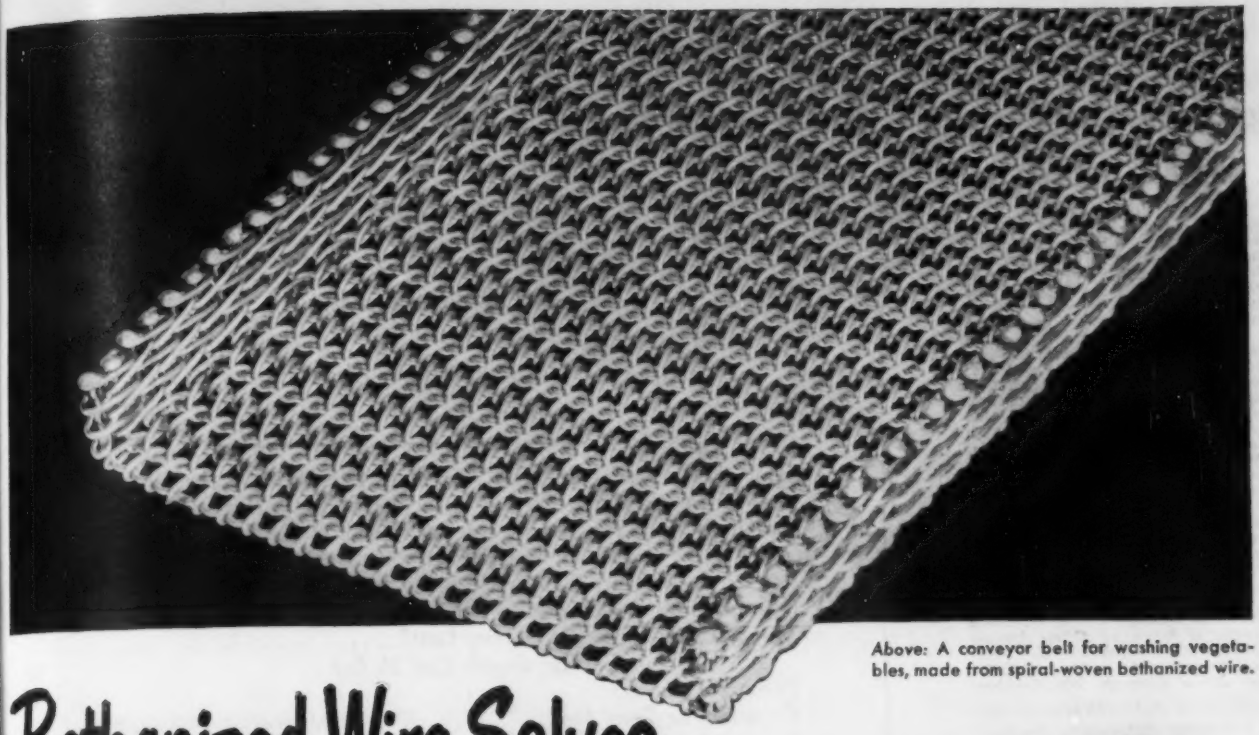
Get complete information on this important foundry process . . .Write today for "Facts on Duplexing" "Bulletin No. FO-4).

WHITING CORPORATION

15601 Lathrop Ave., Harvey, Illinois

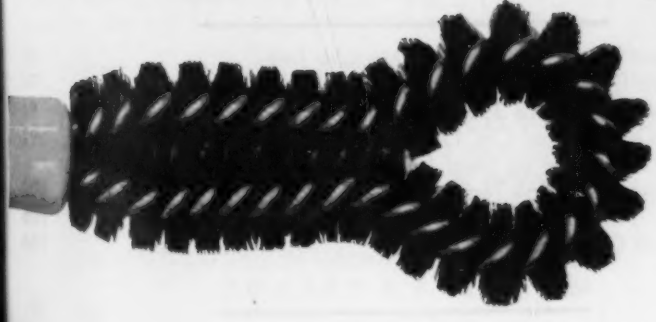
Manufacturers of A Complete Line of Foundry Equipment

Write for these other recently issued Whiting bulletins—
"How To Make Your Cupola Operation More Efficient" (Bulletin No.
"Tips On Improving Cupola Charging" (Bulletin No. FO-2);
"Hot Blast" (Bulletin No. FO-3).



Above: A conveyor belt for washing vegetables, made from spiral-woven bethanized wire.

Bethanized Wire Solves Forming and Corrosion Problems



More and more manufacturers, whether they make chain-link fence or brush handles, are recognizing the value and versatility of bethanized wire.

We're picturing here just a few of the tough assignments in which bethanized wire is doing a good job. Each application requires a corrosion-resistant coating and an ability to withstand severe forming.

In each case the bethanized coating is meeting every requirement. The pure, ductile zinc armor comes through the forming operations without cracking, flaking or peeling off. It's a smooth, uniform coating that can take a lot of punishment and still fight off rust.

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IRON AGE

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DIGEST

of the week in metalworking

STEEL WAGE FIGHT SHIFTS TO WASHINGTON

PAGE 47 Odds are against any quick settlement of the steel wage dispute. Federal price-setters may have ready soon a formula allowing Capehart adjustments on an individual company basis. This news of price rises was of small cheer to the industry. The gulf between factions was seen as widening.

AUTHORIZE NON-COMPETITIVE WAR WORK

PAGE 57 DPA's Fleischmann has certified 3100 firms for non-competitive defense work contracts. Most of the companies are small business but some large ones hit by cutbacks are included. It's a move to spread war work to needy firms outside the restrictions of the competitive bid procedure.

HOW LONG WILL INDUSTRY BE UNDER CMP?

PAGE 55 Basic metals will be parcelled out to industry under CMP for a much longer time than was originally expected. When CMP took effect, Mobilizer Wilson believed lifting of controls should begin in '52. The target date today is vague. A long stay is expected. Steel wants some decontrol.

METALWORKING PROTESTS PAPERWORK PLAN

PAGE 67 Metalworking is vigorously opposing an input-output system of production planning through its spokesmen in Washington. The load of paperwork would entail enormous costs and be strangling. Advanced by a Harvard economist, the plan would compare materials consumed with output levels.

BLOATED INVENTORIES FOR WAR OUTPUT

PAGE 72 While pushing procurement of materials for civilian car output to the limit, some Detroit executives show worry over inventories that are steadily growing for defense work. Delays in tool deliveries and engineering changes slow up war work but materials from suppliers continue coming in.

RECOVER IRON FROM IRON PYRITE CINDERS

PAGE 77 On the basis of pilot studies an effort may be made to recover iron from a million ton dump of iron pyrite cinders in California. Sulfur has already been removed. Copper and zinc might also be recovered from the waste pile. Industry turns to a backlog of waste for a metals source.

TOOL USERS SEEK SIMPLIFIED CONTROLS

PAGE 79 Machine tool users show a great interest in simplified controls to reduce the degree of skill needed by operators, an American Society of Tool Engineers survey reveals. One-half of those replying wanted simpler, more foolproof controls. Need for productivity still ranks highest in replies.

QUENCH-TEMPER TREATING OF NODULAR IRON

PAGE 89 Nodular irons require at least one-half hour at 50°F above critical temperature range. Predominantly ferritic structures may require longer or higher-temperature soaking. Tempering at 1000°F produced 142,750 psi tensile strength with 290 Bhn in a composition with a 3.10 pct carbon content.

RAPID ANALYSIS CHECKS CERIUM IN STEEL

PAGE 94 A rapid method of determining the cerium group rare earth content in steels where they are used as additive agents has been developed. The method involves precipitation with dry sodium peroxide powder from the still acid sulfate solution. Lanthanum, neodymium are coprecipitated.

PLATE ALUMINUM ON STEEL SUCCESSFULLY

PAGE 100 Aluminum has been successfully electroplated on steel from a fused aluminum chloride-sodium chloride salt bath. The plate is uniform and no interfacial layer of iron aluminum alloy occurs. Aluminum coated steels show high resistance to rusting in both industrial and high salt atmospheres.

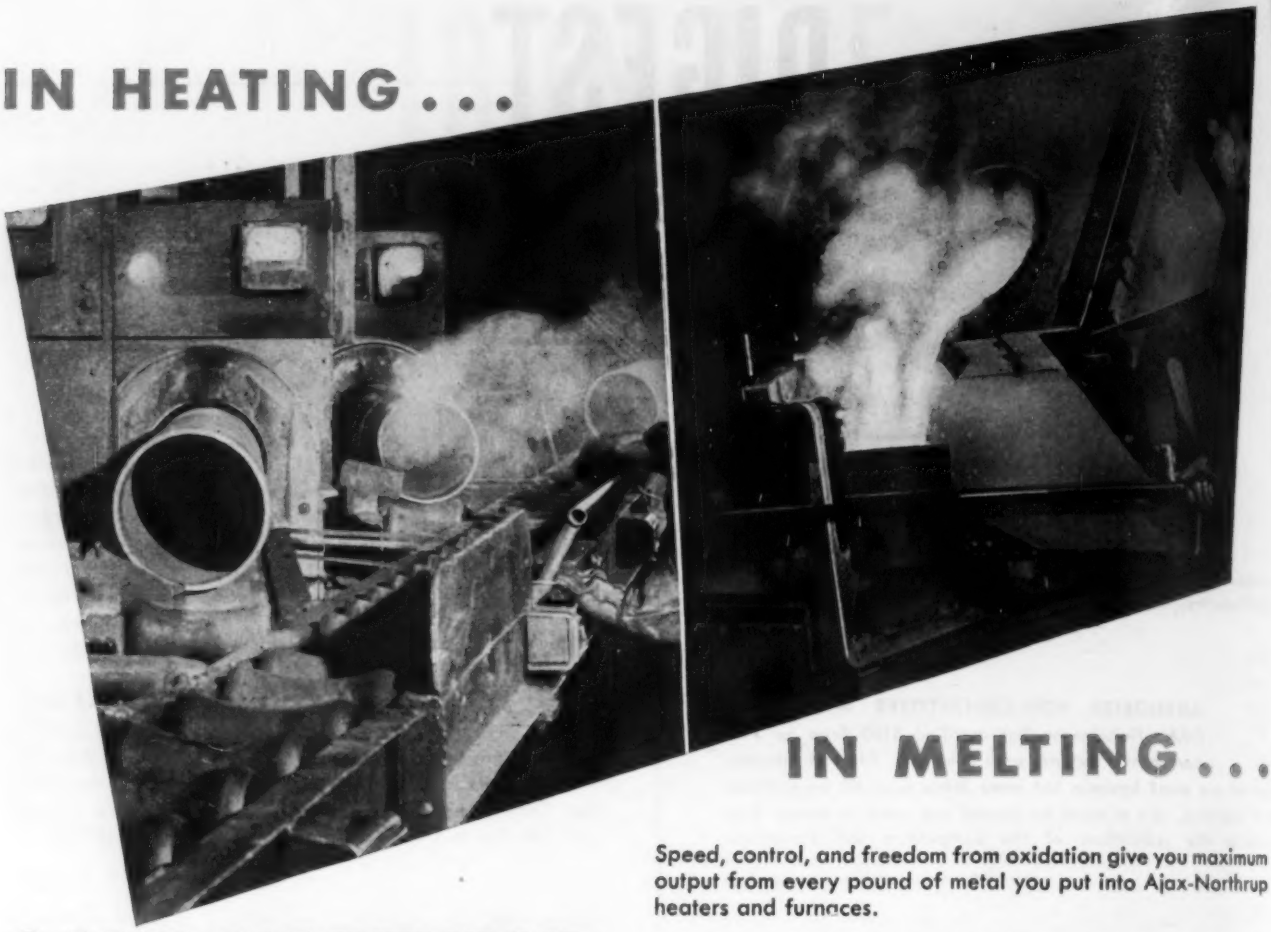
SOME MILLS OFFER BIGGER STEEL QUOTAS

PAGE 127 Steel mills believe they can sell all they can make during the second quarter. But they think it will take some effort. Some mills are offering customers larger quotas of products which have been getting easier. Overall supply will still be tight. No easing yet on bars, plates, structurals.

LIGHT STEELS DIRECTLY REDUCED FROM ORE

NEXT WEEK Fine, prepared ore or mill scale is reduced with coke and limestone in a continuous kiln, yielding plain carbon or alloyed steel. Bars, slabs and pipe have been produced with densities of 1.0 to plus-6.0 g per cc. Weight for weight, light steel, while weaker, is also much cheaper than aluminum.

IN HEATING . . .



IN MELTING . . .

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Speed, control, and freedom from oxidation give you maximum output from every pound of metal you put into Ajax-Northrup heaters and furnaces.

Induction melting furnaces melt so fast there's no time for oxidation—losses of critical elements are held to a minimum. One user, melting stainless steel, reports recovery of 100% of the nickel charged, 99.0% of the chromium, 90% manganese, and 92% columbium. Another saved $60,000 a year just by reducing chromium losses!

Forging heaters are equally thrifty. One automobile manufacturer reports ten tons of steel saved a day—enough for 3800 additional forgings. Savings up to 20% are commonplace, because fast, automatically timed induction heat eliminates steel-wasting scale and permits the use of smaller billets.

Ajax-Northrup melting furnaces are available in sizes from eight ounces to 8 tons, to melt any metal. Heaters for forging and other uses can be engineered to suit practically any of your high-speed production line jobs. Put our 35 years of experience with induction to work for you—write us today!

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the Iron Age
FOUNDED 1855

Make No Mistake About It

SOON we are all going to be steamed up about labor, capital and politics. We may get so steamed up at times that we will blow a stack or flip a lid.

Unions and management will soon be in such a lather that someone from Mars would think we were all sadists, super egoists or just plain plug-uglies.

We are in the middle of a finger pointing game over who is responsible for the lag in defense. That there is a lag we know. Taking military estimates as "guesses" or wishful thinking does not alter the picture.

Attempts will be made to pass the buck on military lags to industry. It won't work because no part of the military program has been held back because industrial materials have not been available for defense.

Soon we will be split at our dinner tables over the national political guessing game of who will be the next president. Before the Great Shows of both parties take place this summer there will be many strained relations even within families.

All this pushing and pulling will be in the world press for all to read. Our allies will see it and hash it over. Many of them, as before, will look upon us as a manic-depressive race of people. But they know a little about Americans. They have seen us close ranks before in the face of a common emergency.

Stalin does not know us so well. He may take a wrong slant of our domestic squabbles. He might think that we don't love each other when the chips are down.

Throughout history big wars have not been planned. They have started because someone did not judge or understand the other side correctly. Stalin and his gang might make the same mistake, this year or next, based on what they think is a hopelessly split America.

We do have our differences. We are ready at times to go the limit to fight for them. But when Americans support the cause of individualism and protection of the rights of free people there is no schism at home. We hope the Soviets and their pawns know this.

Tom Campbell

Editor

Who Profits Most from the sale of a BAKER TRUCK?

MANUFACTURER? TRUCK SALESMAN? BUYER?

YOU BE THE JUDGE:

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- In a **STEEL WAREHOUSE**, 3 men and a Baker Truck now handle work formerly requiring 6, 8 and 10 men—often with overtime.

- A large **ELECTRICAL MANUFACTURER** saves $10,000 per year in scrap-handling costs with this Baker Fork Truck with revolving head. The company earns an additional bonus of $10,000 per year by getting a better price for the scrap when sold.

These are but a few of the thousands of case histories, proving that the Baker customer profits most. Our profit and the salesman's commission are relatively small, one-time earnings. But our customers earnings go on year after year—often for more than a quarter of a century on a single investment.

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Dear Editor:

Letters from readers

Anti-Justice

Sir:

You are to be congratulated on the good editorial, "Anti-Justice," in your Dec. 13 issue.

While we are a very little outfit, we have had some associations more or less with all of the aluminum producers and very thoroughly agree with your article.

Were there much less government by directive, interference and meddling, probably the common interest would be served much better than is being done at the present and in the recent past.

We hope your comments will make themselves felt in the proper channels.

J. R. McKEE, JR.
President

Fabricated Products Co., Inc.
West Newton, Pa.

It Just Isn't So

Sir:

Another one-two editorial (It Just Isn't So!) in your Dec. 20 issue. "What we need is scrap not threats."

Keep it up, you're doing a fine job.

E. L. SOLOMON

Max Solomon Co.
Pittsburgh

Keepsake

Sir:

If my memory serves, it was early in 1937 that THE IRON AGE carried an editorial by John H. Van Deventer entitled "Social Security in Frogdom."

I cut that out and carried it in my pocket till it wore out. I would like very much to obtain a copy of that editorial. Can you assist me?

T. C. MERRIMAN

Sarasota, Fla.

Thank You

Sir:

Our editorial people have made a point of telling me how helpful you have been to them during the year, and how grateful they are to you. I'm sure you know that we would have a hard job keeping up *Time's* standards if it were not for just such generous and dependable cooperation. Many thanks.

J. A. LINEN
Publisher

Time
New York

Useful

Sir:

In your Oct. 4 issue you published a chart of comparable arcwelding electrodes.

You are to be complimented for a very good job. Charts, such as these, help the manufacturer, the sales offices and the consumer.

Recently we have been asked for the address of Universal Welder Corp. which appears on your chart. We would appreciate it if you would give us this information.

W. G. BLACKWELL
Electrode Field Engineer

Welding Dept.
General Electric Co.
Fitchburg, Mass.

The address of Universal Welder Corp. is 735 Carnegie Ave., Cleveland 15, Ohio. Incidentally, a few reprints of these charts are still available at a nominal cost. Address Readers Service Dept., THE IRON AGE.—Ed.

Radius Tools

Sir:

In a recent edition of your magazine you had an article on lathe work in which you mentioned radius tools, both those used in toolposts and those replacing toolposts.

I would appreciate your sending me the names and addresses of some companies manufacturing these tools.

R. MOORE

St. Louis

Among the makers of radius tools are Woods Mechanical Laboratory, 23 Smith Ave., Newport, R. I., and C. B. Teeter Co., 4470 Oakenwald Ave., Chicago 15, Ill.—Ed.

Reports on Boron

Sir:

As you are well aware, the present critical material situation makes the use of boron steels almost mandatory, if production is to be maintained. In line with this thought, the Detroit Arsenal has compiled a report based on the works of others and has dipped freely into the various articles published on the subject of boron steels.

May we have your permission to use various excerpts from THE IRON AGE articles of July 5 through Aug. 9, 1951 on boron steels?

The report, which is being issued, is not intended for publication, but merely for distribution to the various facilities who are responsible for the design and manufacture of tactical Army vehicles.

C. W. KYNOCH

Ordnance Corps
Detroit Arsenal
Center Line, Mich.

Permission granted. We still have a limited number of reprints of this series on hand. They are available at 50¢ per single copy.—Ed.

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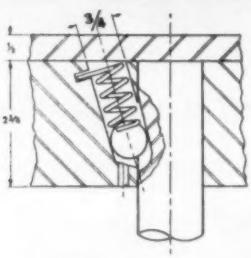

Here's a new combination of an extra heavy duty retainer and new punch design that brings economies of R-B interchangeability to hole-making formerly done by drills or without interchangeable punches.

For instance, in the application shown above, this heavy duty design enabled interchangeable punches to pierce 5/8" thick SAE 10-45 steel and eliminated costly drilling. The ball lock gives positive alignment and sure stripping without the use of other keying devices.

If you have thought your piercing jobs too tough for interchangeable punches, then it will pay you . . . in design, construction and operation savings . . . to investigate this new R-B extra heavy duty retainer. **Allied Products Corporation, Richard Brothers Division.**

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the iron Age
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THE IRON AGE Newsfront

► Although some officials have now reversed their earlier predictions that steel would ease by mid-1952, it is still a fair bet that steel supply will generally be easier by that time. One generally overlooked reason: Inventories in the plants of important defense contractors are beginning to pile up.

One contractor privately told The Iron Age: "We now have a $12 million inventory; it will be up to $16 million in 30 to 60 days but we actually need only a $4 million inventory. Still, the armed services tell us not to cut back on material deliveries."

► Army Ordnance has authorized production of shell mold castings for certain small arms gun parts. In some cases these castings replace forgings and save considerable metal and machining.

► Now being tested for use in aircraft and guided missiles is a new laminating resin with physical and handling properties similar to other polyesters but with the ability to withstand temperatures up to 500°F. Addition of a chemical, triallyl cyanurate, gives it the higher temperature properties.

► A new welding rod coating which does not pick up moisture is now being tested. A ceramic binder, instead of sodium silicate, is employed to prevent brittle welds caused by hydrogen adsorption.

► Auto industry executives figure that among the industry and its parts suppliers, every two cars cut off production schedules throws one man out of work somewhere in the industry. Some of these observers saw a total unemployment of 300,000 if the cutbacks originally proposed by NPA (and later eased) had been adopted.

► The Rover turbine which was demonstrated in the U. S. in 1949 has recently been equipped with a new heat exchanger to save fuel. This experimental car is now being secretly tested by its English manufacturers.

► The attachment that permits the Army's M 3 submachine gun to shoot around corners is not yet in production. Some accounts credited the idea to the Germans but it was patented by an American in 1919. Earlier models in both countries failed to operate properly.

► A railroad costing some $11 million has been proposed to reach the copper mines at Kilembe in British East Africa where it is hoped to push annual copper output to 190,000 tons of concentrates, to yield 24,000 tons of copper and cobalt. Smelting would be done on Lake Victoria with Nile River electric power.

► The British expect to save time in whaling operations with an electric harpoon. Current to kill the whale goes through a conductor inside the harpoon's nylon rope.

► This year will probably mark the peak load (short of war) on dwindling Mesabi iron ore reserves; Quebec-Labrador and Venezuelan ore will not come in this year in quantity but steel capacity will increase by about 10 million tons.

ALL OUT

WITH EC&M LIFTING MAGNETS

Sweeping car bottoms clean—gathering in light scrap ("wind-blown" scrap)—keeping this vital material on the move . . . that's what thousands of EC&M Lifting Magnets are doing!

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STEEL: Wage Tug-of-War Goes to Capitol

Low odds for quick settlement . . . Price men may submit formula for company by company price rises under Capehart . . . Murray orates, CIO officials deliver data—*By R. M. Stroupe.*

Chances for a quick, off-in-the-corner settlement of the steel wage dispute are dim.

For a short time, as labor forces began presenting their viewpoints in Washington, it appeared government might be ready to change its stand and allow price boosts to aid industry. A re-check revealed, however, that what federal pricers may have ready in a few weeks is a formula allowing Capehart adjustments on an individual company basis.

This news was of small cheer to industry, which by now has heard several days of testimony outlining and filling in the wage stand taken by CIO Steelworkers. While they are preparing their own testimony, the companies have been considering a plan for suggesting a move to New York and a presentation of their case there.

Gap Widens—The gulf between management and labor on the effect of wage hikes at this time is widened by the steelworkers' apparent belief there is "something conspiratorial" in industry's refusal to meet their 22-item proposals. This defensive attitude was made plain as labor spokesmen, armed with statistics on profits and pay, brought their demands before Wage Stabilization Board's fact-finding panel.

Opportunities for histrionics at the well-attended early sessions were ample. Union Chief Phil Murray, almost unchallenged for opening-day oratorical honors, lost no time in labelling steel producers' statements on likelihood of greater inflationary pressure because of wage hikes as "arrant, blatant, obvious hypocrisy."

Mr. Murray's lengthy address didn't concern itself with graphic data calculated to convince the 6-man panel of the necessity for higher pay. These details were left to lesser officials, such as CIO Research Director Stanley Ruttenberg. However, the steelworkers' boss made clear that his union is ready to go to the mat with the companies in order to get wage increases, union shop privileges, and additional concessions.

Industry Position—In immediate rebuttal to the union arguments, the steel companies produced a statement summing up their position on a compensation hike now. It said that the inevitable result would be higher prices in many fields and greater living costs for the consumer. These conditions would prevail, the statement said, no matter what the government decided to do about steel prices.

Before the squabble is through, Mr. Murray and his aides are going to make the most of this contention: It is true there was no complete cessation of collective bargaining agreements between the companies and the union from Apr., 1947, through last Dec. 31. But now is the time for eliminating "serious injustices and inadequacies" found in the former agreements. They also feel it's a time for getting in some licks on long-range measures to keep the union rank-and-file contented.

Some Washington observers think what the steelworkers actually will get, wage-wise, may be a boost of 12 to 15 cents per hr. Other concessions seem likely. Industry's benefit from the Capehart adjustment, which may take some of the sting out of the wage needle, could be a steel price increase of $4 to $8 per ton of steel.

STEEL HEARINGS: Government, labor, and industry representatives are continuing their conferences on the steel wage issue in Washington. Talking it over before one meeting are, left to right, CIO president Phillip Murray, WSB chairman Nathan P. Feinsinger, and U. S. Steel vice-president John A. Stephens.

SCRAP: Shortage Vets Take Furlough

Scrap Institute holds 24th convention . . . Goal of 38 million tons in '52 . . . Count on more dormant scrap . . . Equipment easy . . . Worry over weather, factory scrap—*By T. Metaxas.*

The blooded veterans of the scrap iron and steel industry took a brief convention furlough in New York this week before returning to their yards and offices to renew the unrelenting campaign against the scrap shortage.

They relived 1951's battles to keep steelmaking furnaces burning at unfalteringly high operating rates. This 24th annual convention of the Institute of Scrap Iron & Steel was the second consecutive one held in the big town.

The scrap men heard themselves orally patted on the back by government and Scrap Institute speakers for an impossible job fully done. The 34 million gross tons fed to consumers last year were 5 million tons more than the record 29 million tons amassed in 1950. But with even this, the scrap trade finds itself in midstream—with the current growing fiercer.

As Institute President Stanley M. Kaplan told a business session of the convention: "Let us concert and redouble our efforts. Let our motto be—38 million tons or bust in '52."

No Takers—Washington statisticians and sideline pessimists have ceased betting against the scrap industry. They said collecting 34 million tons would crack the field at the seams. But today scrap people report they are at the height of mechanization and are not yet in manpower distress. They could handle yet greater volumes of scrap—if available.

Some scrap people told THE IRON AGE that maximum "normal" scrap is being generated. But scrap people are counting on more surplus scrap reaching the market. They expect a bigger turnover of automobile wrecks, more street car rails uprooted, more dormant scrap released from industry's attics.

Questioned as to the slip of prompt industrial scrap shipments from manufacturing plants, scrap men blamed cutbacks in civilian production and the transition to defense work. They admitted that more scrap would be generated with greater defense output.

But war scrap has one major handicap. It's the waste of hard steel operations and thus holds a higher percentage of alloying elements. Segregating alloy scrap will pose new difficulties. Too much undetected chrome in an openhearth scrap charge can throw the melt off.

The Future—Scrap men are ready to face up to the high capacity of 1954—about 124 million tons of steel per year. They say industrial scrap collections will hit new highs—as will the take of plant scrap. An assist may be granted by a heavier blast furnace capacity to produce more hot metal.

Some doubt was expressed that the steel industry would continue breakneck operations in a more normal market. Production valleys would once again develop and give scrap a chance to accumulate. Somehow a balance between scrap supply and steel production would be reached, scrap men felt.

Scrap equipment exhibitors told THE IRON AGE that the industry had been receiving adequate shipments of handling and processing equipment. Scrap yards had shown foresight and started procurement early. Now high priorities are granted and delivery on even a giant crane is only 6 months.

Weather was a prime concern of the industry. Mill stockpiles are critically low and another heavy attack of winter could cause more openhearth shutdowns. The balmy weather in New York and improved conditions out of town inspired optimism that scrap collections would be sufficient to keep the steel rate healthy.

Sad Note—Speakers at the convention included: Mr. Kaplan; Edwin C. Barringer, executive vice-president of the Institute; Herman D. Moskowitz, chairman of the Institute's liaison committee; Marvin S. Plant, NPA Scrap Section chief.

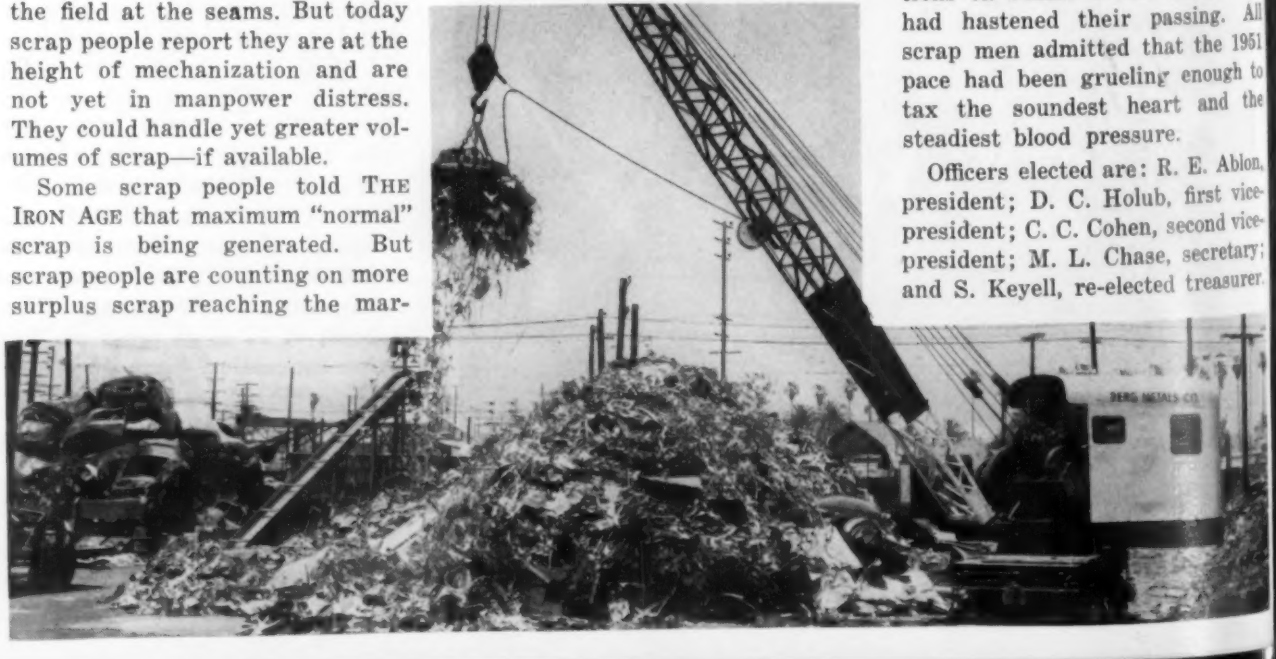
Mr. Barringer touched on Washington skepticism that the industry could gather the vast tonnage of scrap needed.

Mr. Moskowitz called on the government to stimulate the scrap flow from some large sources.

One scrap man said that exertions on behalf of the scrap cause had hastened their passing. All scrap men admitted that the 1951 pace had been grueling enough to tax the soundest heart and the steadiest blood pressure.

Officers elected are: R. E. Ablon, president; D. C. Holub, first vice-president; C. C. Cohen, second vice-president; M. L. Chase, secretary; and S. Keyell, re-elected treasurer.

RAW STUFF: Light scrap being gathered by crane and jalopy bodies will be charged into openhearths to make steel.



TINPLATE: Easier Inventory Control

New annealing line gives "universal temper" . . . Continuous, straight ahead method replaces batch annealing . . . Canmakers can stock fewer tempers . . . Strip passes in giant loops.

GOING UP: Strip climbs five stories in new annealing line at Gary.

A new annealing line at U. S. Steel's Gary Sheet and Tin Mill forecasts greatly simplified tinplate inventory control by canmakers. This would be done by reducing the number of grades of tinplate they must stock to make different kinds of cans.

The new continuous line replaces traditional batch annealing of tinplate under covers, coil by coil. Advantage of the straight-ahead method is "universal temper." Sheets of tinplate annealed by this method are suitable for most types of cans.

Four in One—Up to now it has been necessary for canmakers to stock six different tempers of tinplate. They are numbered T_1 through T_6. The product of this continuous annealing line will be suitable for cans made of all tempers except the first two. One can company estimated this would include about 85 pct of all tin cans it makes.

Annual capacity of the line is 136,000 net tons of sheets, ranging from 0.0075 to 0.015 in. thick in widths 36 in. and less.

High Speed—Eleven separate processes are performed at stages along the line as 3000-ft sheets pass through at a speed of about 1000 fpm. A fresh coil of semi-finished sheet is welded to the one in place ahead as each length is given a uniform heat treatment before finishing into stock for cans. Welding takes a maximum of 12 sec.

Coils are from the 5-stand cold reduction mill. They measure from 30 to 66 in. in diam. and weigh from 5000 to 30,000 lb.

Process Steps—After electrolytic cleaning, scrubbing and rinsing, the strip-sheet flows continuously through a looping tower into a heating zone, where it is quickly brought to a temperature of 1325°F. It is then soaked at that temperature for 10 sec, then cooled successively in three stages slowly between banks of air-cooled tubes, to 1200°; then rapidly to 250° in water-jacketed chambers; and finally to 125° under high-velocity air blast.

Then sheet is again looped in a tower and moved on to the finishing end of the line. Here sample discs are stamped for test and the strip is reeled into coils ready for further processing into tinplate.

Total length of the annealing line is only about a tenth that of the 3000-ft strip being processed at any one time. Strip is directed by rolls into 27 vertical loops of varying size. The longer loops extend from pits 38.5 ft below ground to 55 ft above floor level. Tension exerted in the line adds as much as 3 pct to the length of the product.

Willys Opens Aluminum Forging Plant

A big try to break a bottleneck in forgings for aircraft parts will be made by Willys-Overland Motors, Inc. It placed in operation a $14 million aluminum forging plant at Erie, Pa. The opening followed 5 months of plant reactivation following leasing of the standby plant from the federal government.

The plant is the third largest aluminum forging installation in the country. Its first 50,000 lb of forgings were cross beams and sections for landing gears on the Air Force's C-119 Flying Boxcar.

The Erie plant has an estimated annual capacity of 15 million lb of aluminum forgings, but reaching this top figure is dependent on obtaining sufficient die blocks and raw material. Plant equipment consists of a battery of 27 drop forge hammers, whose capacity ranges from 750 to 20,000 lb.

WAR WORK: More for Small Business?

DPA certifies 3100 firms for higher, non-competitive contracts . . . Are mostly small plants, but some large ones hit by cutbacks included . . . Buyer can award war contracts.

Maximum participation by all firms capable of contributing to the rearmament program is the goal of Defense Production Administrator Manly Fleischmann's certification of 3100 companies for non-competitive defense contracts. It's a move to open the war work door to more in the ranks of small business.

Small outfits make up much of the list, but a number of large companies suffering cutbacks in certain materials also are included. Reportedly, General Motors, Frigidaire, and Westinghouse were among the firms certified. The list comprised firms suffering first quarter copper and aluminum cutbacks to 34 pct, or less, of base period consumption.

Just a Suggestion—Issuance of the DPA list does not force negotiation by government procurement agents. It does give buyers authority to negotiate with such firms at higher prices than would be applicable on a competitive-bid basis.

Apparent loophole for the government buyer is that his hand is not forced into what he may term uneconomical defense contract spending. To place contracts at higher, non-competitive prices would mean that he will be weakening his budget—not getting top value out of the cash he has available. And ordinarily, the procurement man, whether in industry or government, will try to get the best deal possible.

Although the buyer has the authority to enter into these "uneconomical" deals, he has no obvious incentive. That will come when Congressmen go to bat for their constituents. They will "encourage" procurement men to enter into higher-than-competitive defense contracts. Congressional pressure is a strong influence on civil servants whose purse strings are controlled by the lawmakers.

Not Enough—Though commending the DPA action, Small Defense Plants Administration thinks another 10,000 or 12,000 firms receiving first quarter cutbacks to exactly 35 pct of base period copper and aluminum consumption need preferential status, also.

On Capitol Hill, additional anxiety for the small businessman has been expressed. The House Small Business Committee has issued a report stating that small firms received 24.5 pct of the dollar value of military procurement awards in fiscal 1950, 21 pct in fiscal 1951, and only 18.5 pct in the first quarter of fiscal 1952. "This trend," the committee says, "must be reversed."

To improve the situation, the legislators recommended that:

(1) Military procurement officials cooperate fully with Small Defense Plants Administration to stimulate small-business participation in procurement.

(2) Consider the need for enlarging authority and operations of SDPA, if it can be shown the agency lacks the power Congress intended for it.

(3) Set-off clauses in subcontracts be banned. (SDPA announced earlier that many prime contractors volunteered to abandon the clause.)

(4) Direction 3 to National Production Authority M-1, allowing steel mills to set up allocation systems of their own within controlled materials plan boundaries, be rescinded.

(5) Further efforts be made to supply steel warehouses with adequate stocks, and eliminate difficulties imposed on independent warehouses by the present base period.

(6) Use plain English to word regulations.

(7) Defense agencies refrain, as much as possible, from operating in fields where they compete with regular commercial firms supplying goods or services.

CONTOUR WELDING: Linde Air Products Co.'s new Heliarc HWM-1 torch contour welds semiautomatically on jobs that formerly required manual apparatus. The new torch uses a filler rod which is fed electrically into the tungsten arc.

Helping Hand — Preferential treatment for defense-contract-seekers in areas where unemployment has increased has been authorized by Comptroller General Lindsay C. Warren.

Warren, acting on the request of Defense Mobilizer Charles E. Wilson, ruled this week that rearmament contracts may be placed in these critical areas when necessary to the public interest, no matter if lower bids might be obtained in other sections.

Competitive bidding, Wilson said, will be used on defense contracts wherever possible in critical areas.

Warren's office will review all negotiated contracts involved in the ruling.

Car of Future:

Press sees Lincoln Continental's successor on engineering tour.

Henry Ford II last week invited 300 members of the nation's press to roam behind what he called "the front parlor of our engineering laboratory." For 2 days technical writers had the privilege of seeing where Ford spent a large part of the $770 million dollars the company has invested in new facilities since the end of World War II.

Climaxing the tour of greatly-expanded engineering facilities, were displays of Ford, Mercury and Lincoln models for 1952 as well as a new prototype model (1950X) the company is proposing to build in the future to succeed the Lincoln Continental.

The proposed new Continental has many features that will later go into the production model. The car on exhibit was a clay model, complete with paint, plating and upholstery but with no engine or mechanical parts.

Future Features — In showing its "car of tomorrow," Ford disclosed that its engineers are planning to employ aluminum and magnesium alloys extensively. Engineering details of a new, highly efficient "turbo-dyne" high compression combustion chamber are being worked on. The car will have a new carburetor and a Ford "multi-plex" throat manifold.

Performance characteristics and horsepower were not disclosed. The car is being developed under the watchful eye of Henry Ford II who has made many of the design suggestions embodied in it.

The new Continental prototype is a 4-passenger sedan with one-piece, curved windshield and a glass top that retracts into a leather-covered canopy. Parking and fog lights are incorporated in the front bumper. In place of the usual hood ornament there is a simple recess in the hood. The production model will have non-glare-low-heat transmitting glass. Brakes and steering will be power operated.

The present model incorporates such features as a telephone, dictaphone, automatic jacks, warning lights and hood and rear deck controls.

Hot Extrusion:

B&W makes first seamless stainless tubing with new French process.

New hot extrusion facilities of Babcock & Wilcox Co.'s Tubular Products Div., Beaver Falls, Pa., have produced their first lot of seamless stainless steel tubing using the French Ugine-Sejournet process.

Luke E. Sawyer, vice-president, said the B&W plant is the first in America to begin practical production of extruded hollow or solid sections under the new process. It enables for the first time extrusion of metals which are difficult to forge. Finer and more complicated sections than could be made with even the more readily forgeable steel alloys are now possible.

IN PRODUCTION: Seamless stainless tube is produced by Babcock & Wilcox Co.'s new hot extrusion facilities at Beaver Falls, Pa. Sections below are B & W Croloy 18-8 tubing, (left) extruded, and (right) after pickling.

Heart of the Ugine-Sejournet method is use of glass to serve for a very short time as both a lubricant for the hot worked metal and as an insulator to protect the dies.

B&W Croloy 18-8S, a stainless steel alloy containing 18 pct chromium, 8 pct nickel, went into the initial run of extruded seamless tubing. The tubes were then "Roto-Rocked". Claiming the distinction of producing the first stainless steel tubing in America back in 1922, B&W selected stainless as appropriate for the first extrusion operation.

B&W announced its plan to hot extrude tubing in the middle of 1950 after obtaining a license to use the process from its creator, Comptoir Industriel d'Etirage & Profilage de Metaux of Paris, France.

B&W's Tubular Products Div. has plants at Beaver, Pa., and Alliance, Ohio. It makes seamless and welded tubing in a complete range of carbon, alloy, and stainless steels for pressure and mechanical applications.

Koppers Streamlines Research

A bigger, more unified research program will result from rescrambling of buildings and constructing new laboratories at Verona, Pa., reports Koppers Co., Pittsburgh. The firm has purchased the plant site it formerly leased at Verona.

In a few months, the large part of Koppers research will be centered at Verona, said Dr. G. F. D'Alelio, manager of the Research Dept. By 1953 Koppers expects to have 200 chemists, physicists, engineers, and technicians working at the site. Much new equipment is being installed.

New facilities will permit pilot plant tests to be carried out, besides the regular lab work. One pilot plant will make gasoline and oil from coal through the hydrogenation process.

ISRAEL: Seeks Security in Industry

New metalworking plants high on Israel's list . . . Seek U. S. investments . . . Skilled labor short . . . Lack of resources halts big buildup of steel mills, plan electrics—*By T. Metaxas.*

The promoters of industry in Israel want the desert to bloom with new plants. Building up a metalworking industry from scratch may sound romantic but it's all hard work. More plants are needed to stiffen Israel's economy, close the unfavorable export-import gap, and yield a better standard of living to a resettled population.

The Investment Center, Jewish Agency for Palestine, New York, has been casting out for American capital and technical knowledge to bring metalworking into the new state. It has been issuing common-sense reports on market conditions, financing, tentative operational procedures, and export possibilities.

Drop Forgings—For instance, the Investment Center knows that Israel has urgent need for a plant able to produce annually 4.5 million pieces of hand tools, farm implements, and other drop forgings. Financing would require $3 million—half in U. S. cash for purchase of equipment abroad and the balance in Israel funds for construction of buildings.

A necessary adjunct would be an alloy drop forging plant to produce rock drill bits, chisels, pipe wrenches, etc. Also needed are an iron foundry, nonferrous metals plants, and a steel castings plant.

Israel needs a gear industry. Makers of industrial equipment in that country must now produce their own gears. Standardization is unheard of. Gears for Israel are made on primitive non-automatic machinery, puffing up costs and dropping efficiency. To import standard gears is against policy because of the trade gap.

Make Their Own—The Investment Center believes that success of a small plant making a few standard forms of spur, bevel, and worm gears within a range of ½ hp to 10 hp is a foregone conclusion. It could supply 90 pct of Israel demand. Israel manufacturers have already signified intention to relinquish crude attempts at gear making in favor of a better, standardized product.

A plant to make 2 million files and rasps per year is on the must agenda. To save materials, the Investment Center believes it will be possible to recut the files at least once. Plants in Israel now must make their own dies. This makes the need for a tool and die plant apparent. Another possible industry is a machine tool plant to produce from 500 to 1000 lathes a year and expand to other lines later.

Although industrial expansion in a new country offers American investors a chance to live on the ground floor, some difficulties must be overcome. There is a shortage of skilled workers but an abundance of trainable manpower. American investors must come with experts to teach metalworking to a willing people, THE IRON AGE was told.

Electric Furnace—Since Israel has no worthwhile iron ore or coal deposits, native industry will never have a backstop of a large primary steel industry. Billets have so far been imported, a good many from Belgium. However, an electric furnace installation is planned. It will use local and industrial scrap.

Profits equivalent to 10 pct of the investment may be taken out of Israel. Any surplus may be returned to the business or may be reinvested.

To narrow the export-import gap, import of industrial raw materials is on a priority and ration basis. Although American plants may use their original cash set aside for raw material imports to the fullest extent, when this is depleted they must settle under the allocation system.

Recent investors in Israel are Capital Steel Corp. and American Levant Machinery Corp. Capital has almost completed its Haifa plant and is now shipping equipment to bend and straighten steel coils for concrete construction. American Levant will build an assembly and maintenance plant for American construction and materials handling equipment. Last December Welding Electrodes, Ltd., opened its doors.

Big American firms that have installed themselves in Israel are Kaiser-Frazer and Philco Refrigerator Div. The Israel agency feels there's room for many more.

NIPPONESE STEEL: Scrap metal is poured from a huge pot into the fiery depths of a Thomas furnace at the steel plant in Yokohoma, Japan.

Steel Lack Cuts Swedish Output

Steel shortages are forcing Sweden's shipyards and automobile makers to cut down their production. The Volvo Car Factory is halving, to about 110 units weekly, its production of PV 444 motor cars, 4-cylinder models of about 13 hp, British rating. The company is laying off one-tenth of its men.

The director of the Gota yards in Gothenburg said that most Swedish shipbuilders were short of plate. Plate from Japan may be imported.

CMP: How Long Will It Last?

Defense program extended . . . Industry criticizes lack of coordination between civilian cutbacks and defense orders . . . Expect long stay of controls—*By W. V. Packard.*

Industry's supplies of basic metals will be parcelled out by the government much longer than had originally been expected when the Controlled Materials Plan was placed in effect last July 1.

At that time Chief Mobilizer Wilson believed that lifting of controls should start in 1952, as the weight of basic metal expansion began to improve supplies. His view was opposed by the President's Council of Economic Advisers, and other Administration personnel, who preferred no termination date but suggested a minimum of 2 years.

From time to time industry's irritations have been soothed by official Washington statements. But answering officials have never gone so far as to set a date, or even a target, for decontrol. They have confined themselves to assurances of lifting controls piecemeal—as soon as feasible.

Seek Decontrol—People in the steel industry believe it will be feasible to lift controls on their products this year. On some products they believe the relaxation should begin now. They can furnish plenty of convincing dope to back their views.

The gray market has lost its zip—despite Congressional fanfare. Big sheet conversion deals have just about dried up. But the stinger is this: Demand for a number of steel products is definitely slipping—and they can prove it.

Among these products are cold-rolled sheets, mechanical tubing, wire rope, silicon sheets and chrome stainless. Of course, many of their customers who use these products are tightly restricted by National Production Authority limitation orders. Worse still, many of these same customers aren't getting defense orders to take up the slack.

Coordination Nil—It is probably true that some civilian limitation orders were intended to curb demand on certain products to the point where steel producers would shift output to other products needed for defense. In that they are succeeding. But lack of coordination between cutbacks and letting of defense contracts has been appalling.

The result is growing pressure for decontrol from both producers and consumers. Unless the government is successful in channeling more defense contracts into the hands of these consumers who have so far been regarded as nonessential, NPA will find it hard to answer industry's arguments. This might involve more utilization of the economy as it is and less welding of it into the desired form.

Unemployment, and threat of more to come, has caused the voice of labor to line up solidly with management on the issue of cutbacks. It was this formidable alliance that forced a compromise on projected auto cutbacks in the second quarter.

"Well, let's get down to business."

Need War Work—Defense officials insist that defense and defense-supporting requirements must be the basis for cutbacks. But, though their views may be unchanged, their actions have been tempered by expedience. Much opposition to manufacturing cutbacks would melt away if defense contracts were more readily available to take up the slack. Better scheduling and closer coordination could be the answer.

So far government officials have generally lumped so-called essential civilian and direct defense uses together in stating steel requirements. Impressive as this total sounds, it conceals the fact that direct military needs so far take less than 12 pct of total steel supply.

With new steel capacity now coming into production at a rate of about a million tons a month, many in industry doubt that much deeper civilian cuts will be necessary. Barring a costly strike or raw materials trouble, the new capacity should offset increasing military needs.

Nonferrous Squeeze — If steel controls are not relaxed, the market on some products may become glutted by midyear. Wherever possible producers are shifting output to other products in short supply. But there is a practical limit beyond which they cannot go.

For many manufacturers the more severe cuts on aluminum and copper make steel restrictions almost academic. These other basic metals are the limiting factors on production. Shift to a 140-wing air force and other changes in defense planning indicate that mobilization goals will be extended in size and time. This means that controls will stay. They may be relaxed as basic metal production swings the balance in favor of supply, but they will stay in effect.

CMP: Civilian Goods Cut 25 Pct

Dropping allocations to cut back consumer goods output up to 25 pct below first quarter . . . Nonferrous metals rather than steel held responsible . . . List status of industries.

Deeper cutbacks in production of consumer goods, ranging up to 25 pct under first quarter levels, are expected to result from lowered allocations of controlled materials for the second quarter.

Except for structural and plate, both still critically short, reduced production levels will not result so much from lack of steel as from copper, brass, aluminum, and nickel.

Direct and supporting requirements for defense will take about 80 pct of carbon steel, it is now estimated. For copper, brass mill products, alloy and stainless steel and aluminum, defense needs will be more than half the supply.

Only 6 Pct—As for nickel, the defense take is and will remain at about 94 pct of available supplies—leaving a minimum of 6 pct for civilian uses.

Status of the so-called nonessential industries such as jewelry, venetian blinds, metal furniture, and dozens of others will not be changed unless for the better. They currently are allowed 10 pct and 20 pct of base period copper and aluminum—but this may be increased slightly.

A brief run-down of the second quarter production outlook of major manufacturing industries, based on initial allocations of controlled materials for the second quarter, is approximately as follows:

Passenger Cars — Estimates ranging from 800,000 to an allowable ceiling of 930,000 units, depending on use of allocated materials. (See p. 75.)

Trucks—Materials allocated on a basis of a probable production of 240,000 units, same as for first quarter.

Railroad Equipment—Down 14 pct from first quarter, with the allotment sufficient to support output of 15,000 freight cars, 2000 tank cars, and 582 locomotives.

CMP Allotments—Second Quarter

General Claimants	Total Steel (Tons)	Total Copper & Copper Base Alloys (000 lbs)	Total Aluminum (000 lbs)
Estimated Supply	**21,810,500**	**1,391,000**	**705,000**
Department of Agriculture	52,105	1,376	87
Dept. of Army	32,560	1,392	194
Atomic Energy Comm.	118,790	7,673	5,553
Civil Aeronautics Admin.	20,098	1,222	194
Defense, Dept. of	2,617,361	309,940	278,190
Defense Electric Power Admin.	339,650	62,009	58,212
Defense Fisheries Admin.	712	26	....
Defense Minerals Admin.	39,250	1,605	340
Defense Solid Fuels Admin.			
Coal Mine Construction	12,790	259	19
Coke Oven Construction	26,710	321	2
Defense Transport Admin.	74,855	2,133	146
Federal Civil Defense Admin.	5,106	74	39
Federal Security Agency			
Education	128,279	5,354	8
Hospitals	75,850	2,723	388
General Services Admin.	27,437	1,007	81
Housing & Home Finance Agency	78,600	3,011	48
Dept. of Interior	9,308	232	48
Maritime Admin.	121,100	2,950	194
OIT-ECA	669,484	10,114	1,746
Petroleum Admin. for Defense	1,710,375	7,775	1,240
Public Roads, Bureau of	251,525	592	172
Veterans Admin.	12,655	1,278	141
Total	**6,424,600**	**423,066**	**347,042**
NPA Divisions			
Agr. Mach. & Impl. Div.	541,822	9,272	7,429
Aircraft Div.	16,181	1,502	8,781
Aluminum & Magnesium Div.	15,625	....	5,346
Building Materials Div.	849,263	51,156	46,494
Canadian Div.	467,050	3,731	1,843
Chemical Div.	115	881	2,970
Communications Equip. Div.	43,400	43,588	2,620
Construction Machinery Div.	456,179	6,046	1,731
Consumer Durable Goods Div.	872,180	34,584	48,030
Container & Packaging Div.	1,526,396	288	19,561
Copper Div.	42,150	3,602	1,746
Electrical Equipment Div.	655,261	164,695	31,382
Electronics Div.	58,900	30,803	12,244
Engines & Turbines Div.	588,330	30,893	3,299
Facilities Bureau			
Construction Controls	18,010	504	....
Industrial Expansion	583,938	29,340	10,890
General Components Div.	1,203,225	182,456	21,004
General Industrial Equip. Div.	532,568	40,860	15,369
Iron & Steel Div.	211,062	3,955	116
Leather & Leather Prods. Div.	9,833	387	388
Lumber & Wood Products Div.	6,976	131	822
Metalworking Machinery Div.	652,535	32,357	8,464
Mining Machinery Div.	135,518	3,769	269
Misc. Metals & Minerals Div.	3,561	2,351	82
Motion Pic. Photo. Prods. Div.	7,601	971	2,710
Motor Vehicles Div.	3,009,760	106,683	59,400
Ordnance & Shipbldg. Div.	105,150	9,672	928
Printing & Publishing Div.	4,700	1,058	459
Pulp, Paper & Paperboard Div.	1,001	41	26
R. R. Equipment Div.	1,599,141	84,320	4,684
Rubber Div.	32,395	3,588	954
Scientific & Tech. Equip. Div.	49,952	39,853	13,541
Service Equipment Div.	43,813	2,695	3,881
Water Resources Div.	220,415	3,131	368
Total	**14,563,126**	**929,163**	**337,831**

Industrial Construction — No new starts to be approved during the quarter with only enough materials allocated to keep present work going.

Commercial Construction—Allocations held to a minimum with only most critical of new starts given any consideration.

Housing—Now running at rate of 800,000 units, will be cut another 25 pct to 600,000 rate, amounting to a 40 pct cut from last year's levels.

Schools, Institutions—Sufficient to keep work already started on the move. Some new starts will be given allocations.

Highways—Allotments will permit higher levels for super-important projects with all others only slightly above first quarter.

Maritime—Allocations will be increased for merchant and other marine, will permit some delayed starts.

Consumer Hard Goods—Reduction of about 10 pct from the overall standpoint, some hit harder than others, meaning that production should be at about 45 pct pre-Korean levels.

Exports—Will also be hit hard.

Industry Controls This Week:

OPS Orders

CPR 30, SR 6—Allows battery manufacturers to pass on costs.

CPR 61, Amend. 2 — Establishes optional alternate pricing methods for certain exporters.

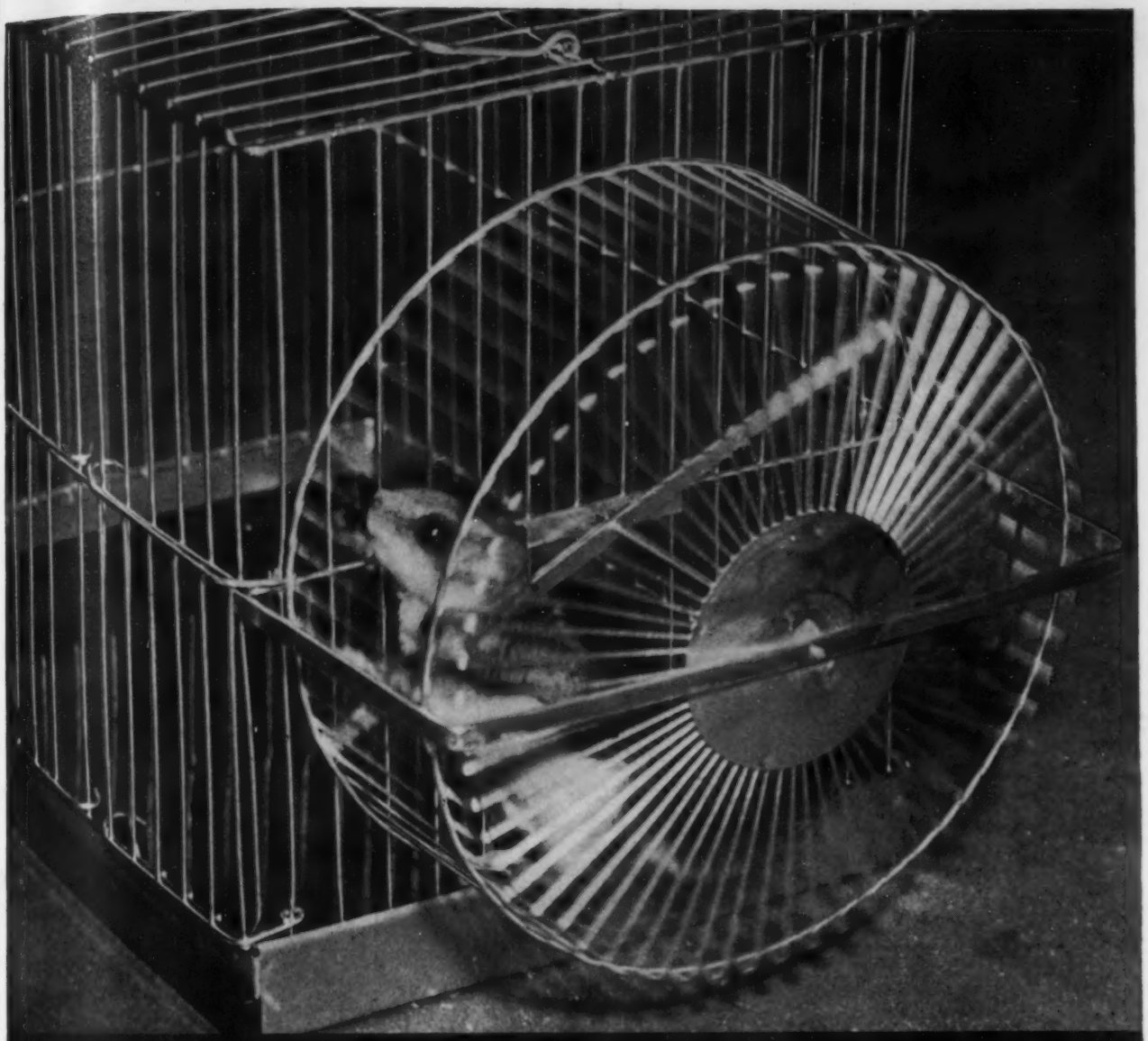
CPR 67, Amend. 7 — Changes machinery markups for new resellers.

CPR 22, Amend. 40—Allows manufacturers using this regulation to set retail prices under it. Allows new manufacturers, in first fiscal year of business, to remain under GCPR if gross sales stay under $250,000.

CPR 22, Amend. 41, and CPR 30, Amend. 29—Grants conversion steel users a full month to compute added costs as a basis for price revisions.

Fowler Succeeds Fleischmann

Henry H. Fowler has been appointed National Production Authority Administrator, succeeding Manly Fleischmann, who resigned to devote full time to his post as Defense Production Administrator.



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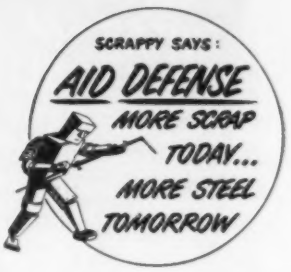
Let us try to help you! Call one of our salesmen when you have a problem on CMP. He has handled a large volume of orders certified under CMP regulations and is familiar with the application of these rules to most steel supply problems. He will do everything possible to help you.



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UNITED STATES STEEL COMPANY

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THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

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THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

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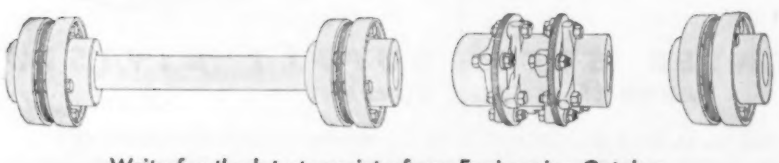

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WARREN, PENNSYLVANIA

Controls

Car Allotments Develop Friction

Sharp difference of opinion between control officials and the nation's railroads has flared into the open, following the decision of Defense Production Administration to cut back second quarter allocations for the industry by 14 pct from first quarter.

Tentative allocations have been made on a basis of permitting second quarter production of railroad equipment at 5000 new freight cars, 2000 tank cars, 582 locomotives, and 363,000 tons of rails. Maintenance, repair and operating supplies will be reduced by 15 pct.

The industry is highly displeased. This rate, it says, is barely sufficient to replace rolling stock which must be retired from service.

On the other hand, Mobilization Director Wilson told the Joint Congressional Committee on Defense Production that he feels the complaints are unjustified.

Reduction in car and locomotive allocations are only temporary be-

STEEL: Industry Produced

As Reported to Ameri

	Openhearth		Bessemer	
1950	Net Tons	Pct Cap.	Net Tons	Pct Cap.
January	7,136,227	96.6	379,252	80.6
February	6,145,634	92.1	255,565	60.2
March	6,750,884	91.3	265,726	56.5
1st Quarter	20,032,745	93.4	900,543	65.9
April	7,318,720	102.3	407,909	89.5
May	7,601,880	102.9	437,006	92.0
June	7,222,185	100.9	406,944	89.3
2nd Quarter	22,142,785	102.0	1,251,859	90.6
1st 6 Months	42,175,530	97.7	2,152,402	78.3
July	7,224,306	97.0	380,317	79.8
August	7,318,908	98.0	405,118	84.8
September	7,262,359	100.7	409,218	80.7
3rd Quarter	21,805,573	98.6	1,194,651	84.4
9 Months	63,981,103	98.0	3,347,053	80.4
October	7,734,714	103.6	436,835	91.5
November	7,111,829	98.4	370,659	80.1
December	7,434,863	99.8	380,011	79.8
4th Quarter	22,281,406	100.6	1,187,505	83.8
2nd 6 Months	44,086,979	99.6	2,382,156	84.1
Total	86,262,509	98.7	4,534,558	81.3
1951				
January	7,844,982	101.4	431,725	90.4
February	6,935,512	99.3	326,112	75.6
March	8,059,625	104.2	408,926	85.6
1st Quarter	22,840,119	101.7	1,166,763	84.2
April	7,857,161	104.9	392,472	84.9
May	8,071,270	104.3	408,650	85.6
June	7,667,811	102.3	403,001	87.1
2nd Quarter	23,596,242	103.9	1,204,123	85.9
1st 6 Months	46,436,361	102.8	2,370,886	85.0
July	7,704,433	99.8	411,599	88.4
August	7,693,322	99.4	438,822	91.5
September	7,652,167	102.4	404,726	87.7
3rd Quarter	23,049,922	100.5	1,253,147	88.5
9 Months	69,486,283	102.0	3,624,033	86.2
October	8,027,006	103.8	458,128	95.9
November[1]	7,749,190	103.4	411,954	89.1
December[2]	7,885,000	102.2	397,000	83.3
4th Quarter[2]	23,661,196	103.1	1,267,082	89.4
2nd 6 Mos.[2]	46,711,118	101.8	2,520,229	89.0
Total[2]	93,147,479	102.3	4,891,115	87.0

Note—The percentages of capacity operated (1951) are calculated on weekly capacities of 1,746,337 net tons open hearth, 107,806 net tons Bessemer and 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of January 1,

cause of the shortage of steel plate and structurals, he said. The industry, by its own admission, is getting 65 pct of its steel requirements. This would indicate that the present slow-down would not result in a transportation breakdown. He also blamed part of car shortage on slow turn-around.

Set New Machinery Markups

Markups similar to those applying before Korea are available to resellers of machinery and related manufactured items, effective Jan. 12.

Amendment 7 to Ceiling Price Reg. 67 allows the reseller to determine his ceiling price by using the highest percentage markup or lowest discount employed during the period Apr. 1-June 24, 1950, rather than his most recent markup or discount.

It permits sellers to apply to Office of Price Stabilization for a price-determining method.

105.1 Million Tons in 1951

...n Iron & Steel Institute

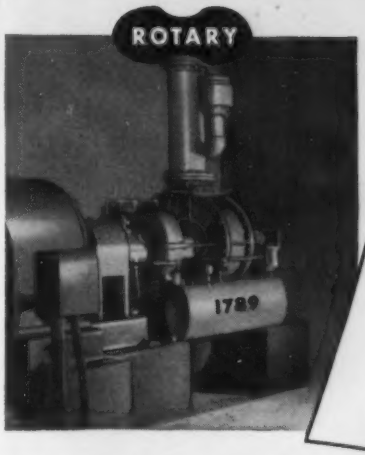
Electric		Tota			No.
Net Tons	Pct Cap.	Net Tons	Pct Cap.	Calculated Net Tons Weekly	Weeks in Month
426,318	73.0	7,941,797	94.0	1,792,731	4.43
401,833	76.2	6,803,032	89.2	1,700,758	4.00
481,212	82.4	7,497,822	88.8	1,692,511	4.43
1,309,363	77.3	22,242,651	90.7	1,729,600	12.86
497,875	86.1	8,224,504	100.6	1,917,134	4.29
525,321	90.0	8,564,207	101.4	1,933,230	4.43
514,101	90.9	8,143,230	99.6	1,898,189	4.29
1,537,297	89.7	24,931,941	100.5	1,916,367	13.01
2,846,660	83.5	47,174,582	95.7	1,823,525	25.87
478,299	79.7	8,082,922	94.8	1,828,715	4.42
518,148	86.1	8,242,174	96.5	1,860,536	4.43
533,422	91.7	8,204,997	99.4	1,917,055	4.28
1,529,869	85.8	24,530,093	96.9	1,868,248	13.13
4,376,529	84.3	71,704,685	96.1	1,838,582	39.00
561,137	96.6	8,752,686	102.4	1,975,776	4.43
540,905	92.8	8,023,393	97.0	1,870,255	4.29
540,437	90.0	8,355,311	98.0	1,890,342	4.42
1,662,479	93.1	25,131,390	99.2	1,912,587	13.14
3,192,348	89.4	49,661,483	98.0	1,890,426	26.27
4,039,008	86.5	96,836,075	96.9	1,857,232	52.14
566,460	88.3	8,843,167	99.9	1,996,200	4.43
504,077	87.0	7,765,701	97.1	1,941,425	4.00
602,504	93.9	9,071,055	102.4	2,047,642	4.43
1,673,041	89.8	25,679,923	99.9	1,996,884	12.86
580,888	95.1	8,840,521	103.1	2,060,728	4.29
614,579	95.7	9,094,499	102.7	2,052,934	4.43
586,148	94.3	8,656,960	100.9	2,017,939	4.29
1,781,615	95.0	26,591,980	102.2	2,043,965	13.01
3,464,656	92.4	52,271,903	101.1	2,020,561	25.87
563,215	87.9	8,679,247	98.2	1,963,631	4.42
603,448	94.0	8,733,592	98.6	1,971,465	4.43
598,004	96.4	8,654,897	101.2	2,022,172	4.28
1,764,667	92.8	26,067,736	99.3	1,985,357	13.13
3,229,323	92.5	78,339,639	100.5	2,008,709	39.00
631,000	98.3	9,116,134	102.9	2,057,818	4.43
632,507	101.0	8,793,651	102.5	2,049,802	4.29
602,000	94.0	8,884,000	100.5	2,010,000	4.42
1,865,507	98.0	26,793,785	102.0	2,039,101	13.14
3,630,174	95.4	52,861,521	100.7	2,012,239	26.27
7,084,830	93.9	105,133,424	100.9	2,016,368	52.14

1951 as follows: Open hearth 91,054,020 net tons, Bessemer 5,621,000 net tons, Electric 7,554,630 net tons, total 104,229,650 net tons.

[1]Revised.

[2]Preliminary figures, subject to revision.

No more "off the cuff" decisions when you compare blower values



Typical R-C Rotary Positive Blower supplying underdraft for reburning carbon in flue dust for four steam furnaces. Pressures up to 10 psig.

- ☐ Choice of Rotary or Centrifugal
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- ☐ Ability to handle overloads
- ☐ Long-time durability
- ☐ Freedom from breakdowns
- ☐ Low maintenance costs
- ☐ Engineering assistance
- ☐ Proved reputation of maker
- ☐ Customer satisfaction

If you are considering new equipment for handling gas or air, we suggest you examine the essential values listed above, before you make your final selection. These factors will help you determine the unit that will best match your specific application, and that will give you the most satisfactory, economical performance.

You'll find that R-C equipment rates high in every one of these essential factors. With capacities ranging from 10 cfm to 100,000 cfm or higher, at moderate pressures, and with the exclusive *dual-ability* line of Centrifugal or Rotary Positive types, you have a wide choice to meet the most exacting needs.

If you'd like to tell us about your specific problem, we'll gladly send detailed information for comparison, or supply engineering help from our 98 years of blower building experience.

ROOTS-CONNERSVILLE BLOWER CORPORATION
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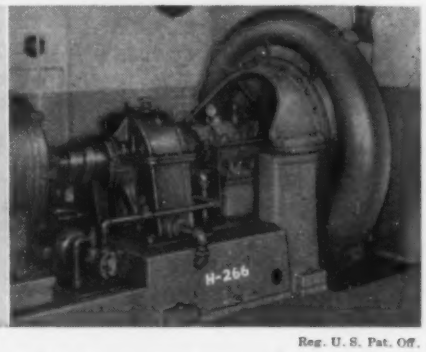
CENTRIFUGAL

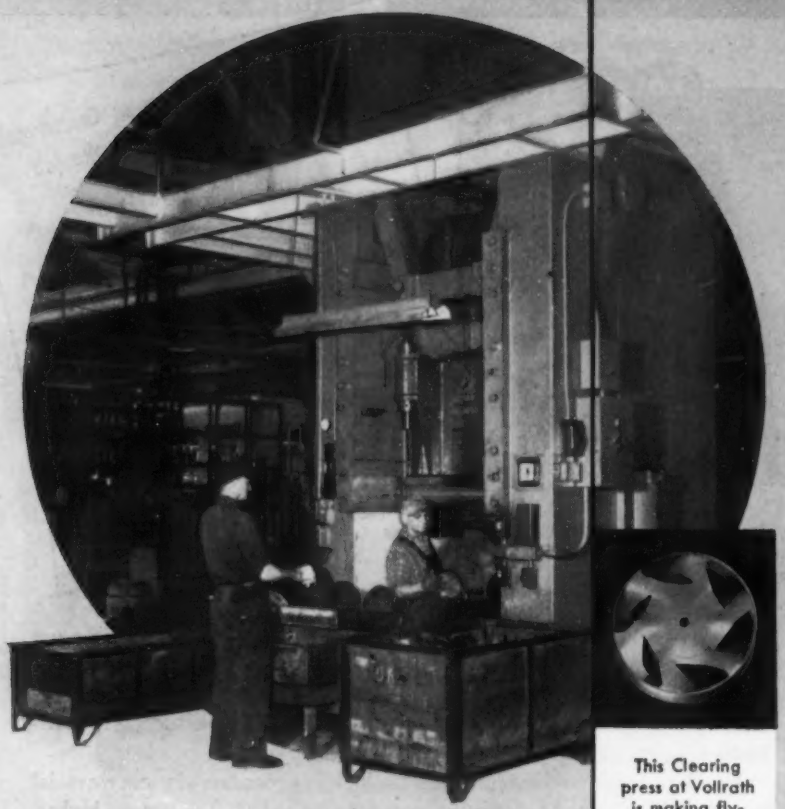
Type OIB, Single-Stage, Centrifugal Blower in cupola service in large automotive plant. Capacity 13,650 cfm. Motor driven with speed-increasing gears.



Reg. U. S. Pat. Off.

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

LISTEN to the difference



This Clearing press at Vollrath is making flywheel fans for lawn-mower engines.

It may be strange to think of a metal-forming press as QUIET in operation, but that's what The Vollrath Company of Sheboygan, Wisconsin, think about their Clearings in comparison to their other presses. Since this company has been making the famous Vollrath Ware since 1874, you can be sure they know presses, and are putting proper value on an important consideration.

Their Clearing presses require definitely less maintenance than their other, less quiet presses. That, of course, is the payoff. The Vollrath people know that noisy operation means strain and wear—and ultimate cost. That's why they buy Clearings.

When you buy or specify a press, we suggest you listen to the difference. It's a good way to save money.

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

CLEARING PRESSES
THE WAY TO EFFICIENT MASS PRODUCTION

—Controls—

Machine Tools:

NPA may simplify finishing, restrict buyer's demand for special specs.

National Production Authority is working on a hatfull of new orders to simplify and expedite production of the machine tool industry.

Two of these have been approved by the industry through its advisory committee. One would simplify finishing and the other would establish new electrical standards.

Under the finishing order, only one primer coat would be required (filler only for bad cavities) and no more than two coats of paint or lacquer. About 20 man hours per unit would be saved.

The other order would prohibit buyers demanding special electrical specifications, such as larger motors or heavier wire.

Ask Markup Rise for Steel Items

Government price men are considering an industry proposal that resellers of merchant trade steel products be allowed an increase to a 25 pct jobber markup over base mill prices and transportation costs of merchant wire and roofing and siding products.

To Restrict Aluminum Pig Use

Conversion of pig or ingot into aluminum products without specific authorization soon will be prohibited under an amendment to M-5 which National Production Authority is now drafting.

Lift Storage Battery Ceilings

Storage battery manufacturers, Office of Price Stabilization says, should be able to maintain overall earnings at their average 1946-49 level on the basis of a newly-granted 3 to 6 pct ceiling price increase.

The price boost, allowed by Supplementary Reg. 6 to Ceiling Price Reg. 30, effective Jan. 14, will affect the entire lead acid storage battery field. At retail, the increase probably will range from 65¢ to 95¢.

Building Gain:

Industrial construction in 1951 rises to $1,975,000,000 total.

Industrial construction increased in dollar volume from $1,100,000,000 in 1950 to $1,975,000,000 in 1951, according to a preliminary estimate by the Bureau of Labor Statistics.

Total new construction for the year, according to the preliminary figures, was just shy of $30,000,000,000, thus confirming earlier estimates by THE IRON AGE.

Despite credit and materials controls, new construction volume increased during the year in nearly all major categories, spark-plugged by military and naval facilities which increased five times over the $177,000,000 in 1950 to $1,045,000,000 for 1951. Warehousing and storage construction by $100,000,000 to a total of $518,000,000.

Commercial Drops—Retail stores and other commercial types decreased by nearly $100,000,000 to less than $800,000,000 for the year and this figure is expected to drop by a third during 1952.

Although the total dollar outlay for new construction for the year was 7 pct above 1950, the physical volume for 1951 remained about the same. Higher costs made up the difference.

Some $21,000,000,000 represented private expenditure and the remaining $9,000,000,000 was public expenditure, including $1,000,000,000 in military construction.

Constructors Seek Stable Costs

The search for greater cost stability in construction of plants for chemical, petroleum and steel industries has been the goal of the National Constructors Assn. throughout its existence, J. F. Pritchard, Kansas City, Mo., retiring president, said last week at the Association's annual meeting in New York.

In reviewing the work of the Association during the past year, Mr. Pritchard said that a considerable degree of success has been

Over 20,000 TORIT DUST COLLECTORS Now IN OPERATION

Solving Dust Problems

with TORIT DUST COLLECTORS

Lint, dust, polishing paste, all are trapped by this TORIT DUST SEPARATOR

Here is a Torit 19-FB Dust Separator connected to a double end polishing lathe. Note the complete accessibility of the buffing wheels and how a minimum of piping reduces friction losses. Here, dust laden air is cleaned and recirculated. No heat is lost through outside vents.

Torit dust collecting equipment is improving working conditions and preventing dust damage in every type of American industry. There are models for all standard applications and special adaptations can be quickly fabricated. They are economical to buy and install and exceptionally efficient in operation. For complete details and latest Torit catalog, write:

Self-contained units for carrying away dust-laden air around grinding, cutting and polishing wheels, wood saws, sanding belts, etc.

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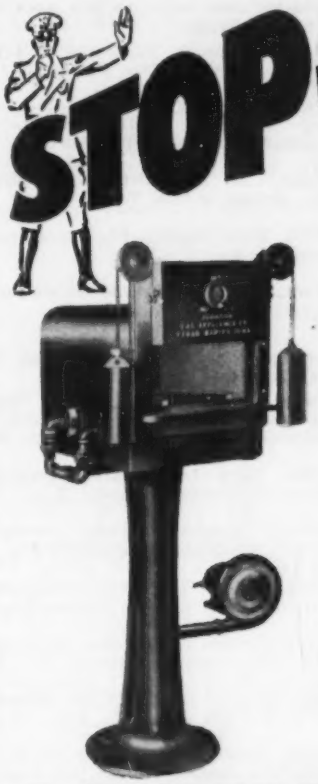

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Save time, save gas . . . get the job done without delay with JOHNSON'S Hi-Speed No. 130A. Made in two temperature ranges. Four-burner unit for steels requiring 1400° to 2350° F. Six-burner for 1800° to 2400° F. Temperatures easily regulated with accuracy. Automatic controls available. Powerful burners fire under hearth assuring fast, uniform heat. Brazes carbide tool tips. Hardens small metal parts. Firebox 7" x 13" x 16½". Complete with Carbofrax Hearth, G. E. Motor and Johnson Blower. Write for complete catalog. Johnson Gas Appliance Company 598 E Avenue, N. W., Cedar Rapids, Iowa.

JOHNSON No. 130A Hi-Speed

4-Burner $295.00
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F. O. B. Factory
Also available in smaller sizes

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reducing troubles?

Torrington Swaging Machines offer a means of reducing rod, wire and tubing that improves the quality of the material, gives a better surface, without waste of stock. Hammer blows (4000 a minute) speed production, and give the metal toughness and resiliency that cannot be obtained by any other method.

Write for your free copy of "The Torrington Swaging Machine." This informative booklet gives complete details on the art of swaging and the extensive line of Torrington Swagers.

THE TORRINGTON COMPANY
Swager Department
555 Field Street · Torrington, Conn.

attained in elimination of jurisdictional disputes among various trade unions. A series of agreements will reduce the number of work stoppages that have occurred over jurisdictional disputes.

Steel Inquiries and Awards

Fabricated Steel awards this week include the following:

9000 Tons, Will County, Ill., generating plant, Public Service Co. of Northern Ill., to American Bridge Co.

3100 Tons, Montgomery County, Pa., Pennsylvania Dept. of Highways, LR 769, Sect. 2C, bridge and viaduct, The Conduit & Foundation Corp., Philadelphia, general contractor, to Bethlehem Steel Co., Bethlehem.

2650 Tons, Chicago, Congress St. Bascule Bridge, to American Bridge Co.

1500 Tons, Lake Andes, S. D., Pen stocks for U. S. Engineers, to Pittsburgh Des Moines Steel Co.

360 Tons, Casper, Wyo., Power plant, to Pittsburgh Des Moines Steel Co.

270 Tons, Ill., boiler house for Monsanto Chemical Co., United Engineers & Constructors, general contractors, to Mississippi Structural Steel Co.

150 Tons, Lancaster, Pa., building addition for Armstrong Cork Co., to Bethlehem Steel Co., Bethlehem.

Fabricated steel inquiries this week include the following:

2600 Tons, Sanish, N. D., Corps of Engineers, Missouri River Bridge.

1000 Tons, Philadelphia, Sun Oil Co., taking bids for floating-roof tanks (platework), no deadline on bids.

770 Tons, Clay and Richland Counties, Ill., Bridge section 7-2F.

350 Tons, Kane County, Ill., Bridge section RD-F.

300 Tons, Chicago, Halsted Bridge superstructure, bids due Feb. 5.

Reinforcing Bar Awards this week include the following:

5000 Tons, Fort Knox, Ky., U. S. Engineers barracks and miscellaneous building, to Ceco Steel Products Co.

1455 Tons, Gary, Ind., Water Filtration plant, to Bethlehem Steel Corp.

1125 Tons, Chicago, Beverly Calumet Sewer, to Ceco Steel Products Co.

750 Tons Chicago, TVA Hangar Midway Airport, to U. S. Steel Supply Co.

700 Tons, Elrama, Pa., Duquesne Light Co., to U. S. Steel Supply Co.

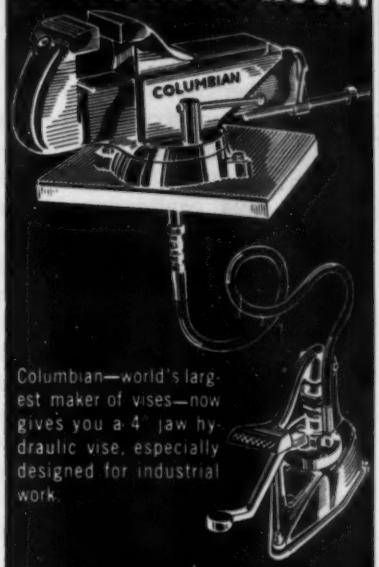
265 Tons, Weirton, W. Va., Turbo Blower, to U. S. Steel Supply Co.

230 Tons, Hines, Ill., laundry building, Veterans Administration, to Joseph T. Ryerson & Son.

225 Tons, Neville Island, Pa., Bureau of Public Roads, to U. S. Steel Supply Co.

125 Tons, Oak Lawn, Ill., school, to Ceco Steel Products Co.

COLUMBIAN
Hydraulic Vises meet every industrial need!



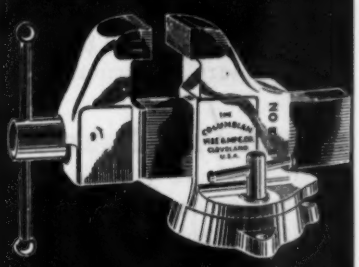
Columbian—world's largest maker of vises—now gives you a 4" jaw hydraulic vise, especially designed for industrial work.

Its use enables operators to employ both hands to handle and position work. Vise is controlled by two simple foot pedals—one for power, the other for release. Stop control is adjustable so that castings are gripped and held with a single power stroke.

Vise closing speed is ⅞" per pump stroke. Jaws close without damaging the lightest castings. Full vise opening can be accomplished in 3 seconds.

Maximum hydraulic pressure is 7,000 P.S.I. Maximum jaw pressure is 4,000 lbs (2 tons). A safety valve protects against overloading.

WRITE FOR FULL DETAILS.
ASK FOR BULLETIN HV-7548-R.



In addition to hydraulic vises, Columbian manufactures a complete line of machinists' hand vises in 3" to 8" jaw widths.

COLUMBIAN Vises
THE COLUMBIAN VISE & MFG. CO.
CLEVELAND 4, OHIO
world's largest maker of vises

Metalworking Groans at Paperwork Plan

Spokesmen veto input-output production planning as a strangling load of paperwork . . . Costs would be astronomical . . . Think over replacing DPA boss Fleischmann—*By G. H. Baker.*

Is the Federal Government's demand for the metalworking industry's compliance with the labyrinth of the so-called "input-output" theory of production planning fully justified?

Clearly and definitely "no" say industry representatives in Washington.

Question of whether or not the Defense Production Administration may properly require about 450 of the nation's metalworking industries and trades to report to Washington the literally billions of figures relating to their purchases and products is now under study by a task committee of spokesmen for the industries that are affected.

Has Veto Power—It is estimated that the automobile industry alone would have to spend about $25 million to set up the reporting procedure proposed by DPA and the Bureau of the Budget. Budget's interest in the project springs from the fact that it has veto power over proposals from other government agencies to impose new reporting forms or questionnaires upon industry.

One industry official who has been working closely with government proponents of the "input-output" theory says frankly that the system "will impose a terrible reporting burden" upon industry, if it is adopted. "The like of it has never been seen before," he states.

What Theory Means — "Input-output" theory, as set up by its originator, Wassily Leontief, Harvard economist, envisages the comparison of total materials consumed with the output levels achieved during each year for each of the end-product classes. Tonnage of materials consumed would thus be supplemented by the additional materials required to produce the component input figures calculated from the use figures supplied by the reporting industries.

Government planners believe this information would be extremely valuable to them in planning expansion programs for nearly all the metalworking industries.

Good Men Scarce — Manly Fleischmann's resignation last week as head of the National Production Authority, coupled with his publicly-announced plans to relinquish his remaining government position (head of Defense Production Administration) within the next few months, is awakening mobilization planners to the fact that top-notch administrators are hard to find.

"I understand Comrade Gudenufsky has invented color television—in red, of course."

Mobilization Director Charles E. Wilson and Commerce Secretary Charles Sawyer must decide within the next few weeks whether or not they must find a new man to fill Fleischmann's present spot, or assign Henry H. Fowler, who succeeded Fleischmann as head of NPA, to both jobs.

Sawyer is known to be in favor of the latter course (thereby retaining control of both agencies), but Wilson is not convinced that one administrator can properly run the two jobs.

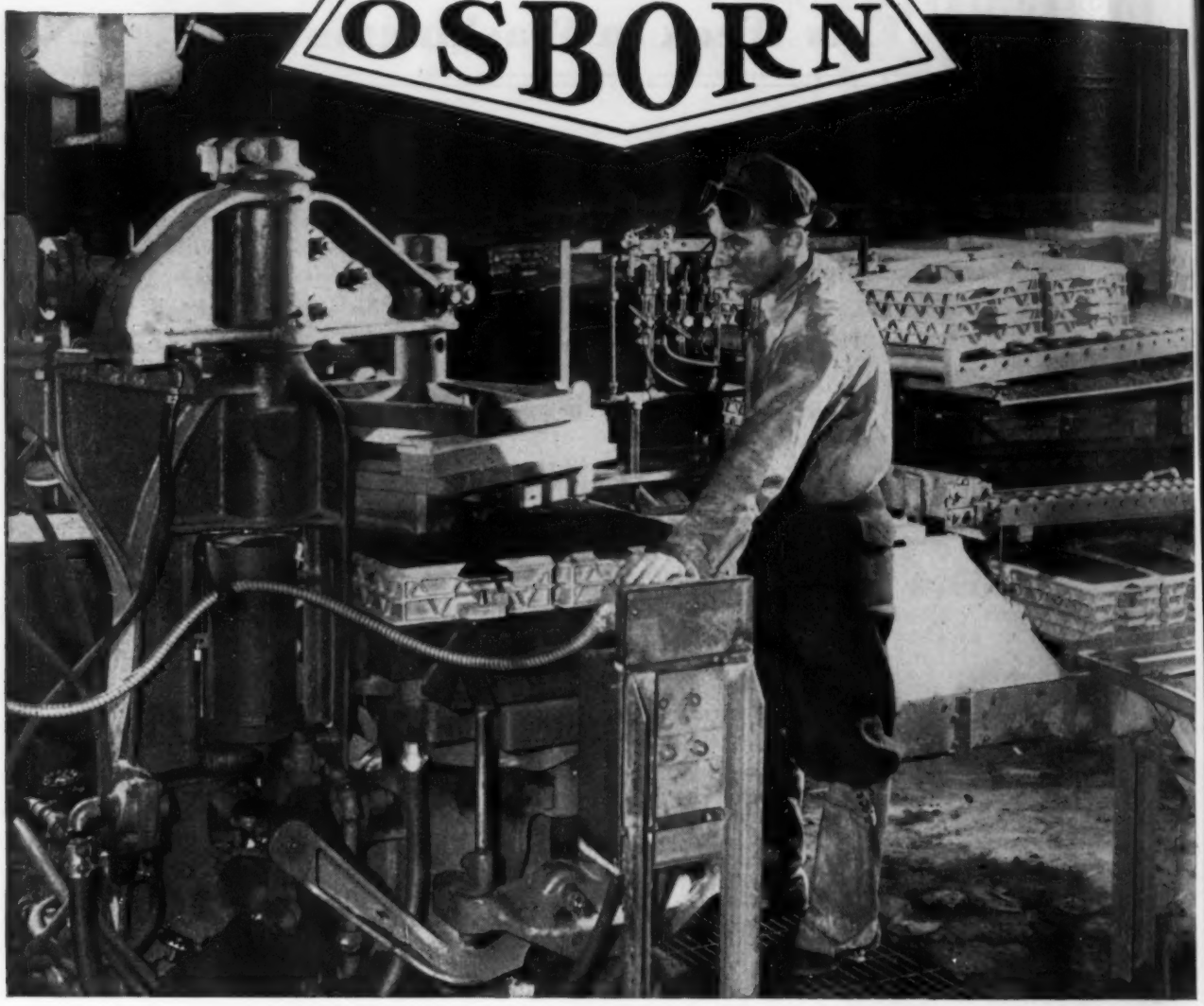
Status Quo—Fact that the new Congress has yet to schedule a public hearing on President Truman's request for a tougher controls law shows up its unwillingness to write any major changes into the basic mobilization program this year.

Congressmen of both parties are voicing doubts and criticism over the White House request for more stringent controls, and at Mr. Truman's charge that Congress "shot the law full of holes" last year.

Chairman Spence, D., Ky., of the House Banking Committee, says he agrees with Mr. Truman that Congress should "repair the damage" to the controls law, but Sen. Maybank, chairman of the Senate Banking Committee, declines comment. He says flatly that he has no plans to hold hearings on any proposed changes in the law.

Ships — Consideration will be given by the House Armed Services Committee to arguments that the U. S. Navy should have two more super-carriers, in addition to the *James V. Forrestal*. The proposed military budget may provide for only one ship.

OSBORN



Osborn's automatic machines ... cut foundry costs!

MORE OUTPUT ... over 80% increase in operating efficiency. Less operator fatigue. Uniform quality production, hour after hour. These and other cost-saving benefits are reported by foundries using Osborn automatically controlled, molding machines and core blowers.

In the operation above, the workman simply loads the machine and presses a button. The machine does the rest ... does it automatically. While the machine goes through its pre-set time cycle, the operator is free to set cores, to inspect completed molds or do other essential work in the production of molds. And there is less scrap due to molding. Less operator training is needed for automatically controlled machines.

Automatic controls are available on many different types of Osborn molding machines and core blowers. A factory-trained foundry specialist near you will gladly show how you can benefit. Call or write *The Osborn Manufacturing Company, Dept. 637, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Molding Machines

A COMPLETE LINE OF FOUNDRY MOLDING MACHINES ... CORE BLOWING MACHINES ... INDUSTRIAL BRUSHES

CONTRACTS: Draft Renegotiation Code

Concrete war contract renegotiation rules on the way . . . First draft submitted to industry for comments . . . Cases will be decided on merits, not by formula . . . Reward efficiency.

Business soon will have a firm set of government rules for guidance in determining fair profits resulting from defense contracts.

U. S. Renegotiation Board is preparing to publish within the next 60 days its final draft of the regulations under which the government determines what constitutes the "excess profits" that come to light in checking over the terms of government defense production orders.

Cue to Accountants—Last week, the board published a 15,000-word "first draft" of the long-awaited regulations. The board made it clear that the rules are now only in "suggested" form. It invites all business firms to examine the proposed regulations, and to submit comments and suggestions before Jan. 31.

It is important to keep in mind that the government does not intend to set any fixed formula for estimating when defense contract profits are "excessive," and when they are not. Each case will be decided strictly on its own merits.

The board warns that allowable profits will not be based upon a percentage of costs.

Firms which make no real effort to keep their costs down, or which incur unreasonably high production costs will have to give a strict accounting of their actions when the time comes to renegotiate defense contracts.

Efficiency Rewarded—"Contractors who sell at lower prices and produce at lower costs through good management, including methods of production, close control of expenditures, and careful purchasing will receive a more favorable determination than those who do not," the board warns.

The new rules apply to all contracts and related subcontracts with the Defense Dept., the Army, Navy, Air Force, and 15 other government defense agencies. Issued under the 1951 Renegotiation Act, the regulations cover all income from military contracts beginning Jan. 1, 1951. This date varies with other agencies.

War Budget:

Spending will reach $94 billion, excluding military's $50 billion.

Available funds for military procurement and construction in the first 2 years following outbreak of fighting in Korea will total about $94 billion, Defense Dept. says. This amount does not include the military budget for fiscal 1953, which may be voted at about $50 billion.

For the 17-month period ended Nov. 30, Defense Dept. obligated $51.1 billion for procurement and construction, of which $43 billion was marked for buying of "hard goods" — tanks, planes, ships, weapons, and the like. Clothing, subsistence, and petroleum purchases required $5.6 billion and construction $2.5 billion.

Phases of Program—In the first 5 months of the current fiscal year, all military obligations, including pay and allowances, research and development, and procurement and construction funds, were approximately $22 billion. Two-thirds of this amount, or $15.2 billion, was the outlay for major equipment and supplies, military construction, and expansion of production facilities.

The Air Force, in the July-November, 1951, period, obligated $7.1 billion, as compared with $4.5 billion for the Navy and $3.6 billion for the Army. These amounts indicate orders placed in the months named, and include contracts with private industry and project orders placed with Defense Dept. industrial facilities, such as shipyards and arsenals.

DIRECTOR: Herbert Johnson, of Jones & Laughlin Steel Corp., has been appointed director of National Production Authority's Iron & Steel Div. Mr. Johnson came to NPA on loan from J&L last May, and has been deputy director of the Iron & Steel Div. since September. In his present position he replaces Wallace B. Quail, who is rotated back to his job as Central Area manager for Armco Steel Corp.

Reset Auto Output Goals

Automobile manufacturers will be permitted to make 930,000 passenger cars during the second quarter—if they can (1) stretch materials from existing stocks, (2) make substitutions, and (3) broaden conservation methods.

This represents only a partial recession from the stand made by control officials earlier this month when it was proposed to limit production to 800,000 units for the 3-month period.

National Production Authority said it would allocate enough copper and aluminum for 800,000 cars, enough steel for 900,000 units, and would permit production of an additional 30,000 if they could so stretch supplies.

A government group is being set up to channel more defense contracts into the Detroit area to take up some of the slack in employment caused by cutbacks.

Industrial Briefs

Philco Corp.—To finance rapidly increasing production of advanced electronic military equipment and missiles, PHILCO CORP. has arranged a $40 million 3-year V-loan revolving credit. This credit, guaranteed to the extent of 70 pct by the Navy Dept., is being extended by 18 leading banks headed by the Pennsylvania Co. for Banking and Trusts.

New Company — Westinghouse Electric Corp. has formed a new company, the DANFORTH CORP., which has purchased assets of the former Danforth Co. from estate of the late I. W. Danforth. The new firm will continue as a Westinghouse distributor.

Stainless Tube—More welded stainless steel tubing and pipe will be available when DAMASCUS TUBE CO., Greenville, Pa (previously Vacuum Melt, Inc.), completes its expansion program. Output will be aimed at supplying chemical, atomic, food, drug and dairy industries.

Corporate Changes—Jones & Laughlin Steel Corp.'s J & L STEEL BARREL CO., is now operating as the Container Div. of the Sales Dept. J & L's warehouses, and Wire Rope & Electricweld Tube Divs. will operate on the same basis, effective Jan. 1. J & L also set up a Traffic & Transportation Div., Pittsburgh, and placed operations of Inter-State Iron Co., under the new Minnesota Ore Div., Virginia, Minn.

New Capacity—GUARDIAN STEEL CORP., 11675 E. Eight Mile Road, Detroit, has added approximately 7200 sq ft to its steel warehouse, bringing existing capacity to 43,000 sq ft under roof. The warehouse provides cranes, shearing, and roller levelling equipment.

Expansion Program — The WEIR KILBY CORP., Birmingham, Ala., affiliate of Taylor-Wharton Iron & Steel Co., of Cincinnati, has announced an expansion program to increase its capacity by 20 pct. The expansion includes enlargement of its main plant some 5400 sq ft and installation of three more heavy planers, a 30-ft spindle rail drill, an Ingersoll plate milling machine and material handling equipment.

Heavy Duty Crane—The Milwaukee shops of the HARNISCHFEGER CORP. early this month turned out the 14,000th heavy duty crane P & H has built since 1889. It goes to the Pontiac Motor Div. of General Motors.

Armor Plate—GERITY-MICHIGAN CORP.'s Logan St. Plant in Adrian, Mich., has been equipped with machinery to produce armor plate as a subcontractor to Standard Steel Spring.

New Program—LUSCOMBE AIRPLANE CORP., Dallas, announced a $450,000 building program which will add 85,000 sq ft of floor space to the permanent building area. Present area of permanent buildings is 102,000 sq ft. Luscombe, a subsidiary of Texas Engineering and Manufacturing Co., Inc., is engaged entirely in defense production.

GUNPOWDER: A Velocity-Power Tool Co. hole punch saved time and money preparing angle iron for exterior brick sills. Power generated by a .44-cal blank cartridge punches a neat hole in 3/8-in. steel. Cartridge is discharged by tapping the firing pin with a mallet.

Special Course — Two hundred and fifty employees of the FREYN ENGINEERING DEPT. of Koppers Co., Inc., are taking a special course in steel engineering principles at Illinois Institute of Technology. Outstanding men in the Chicago area's steel industry are serving as guest lecturers each week.

Service Recognition—A service recognition plan for employees of Joseph T. Ryerson & Sons, Inc., Chicago, has been announced by Charles L. Hardy, president. Employees of 25 years and longer will automatically become members of the RYERSON QUARTER CENTURY CLUB. It is estimated that 290 employees of the various plants are currently eligible for membership.

Records Tumble—Inland Steel Co.'s INDIANA HARBOR WORKS made 1951 the biggest in its history of 50 years by breaking a raw-steel production record that had stood since 1944. The ingot tonnage figure was 4 pct above the 1950 production of 3,675,707.

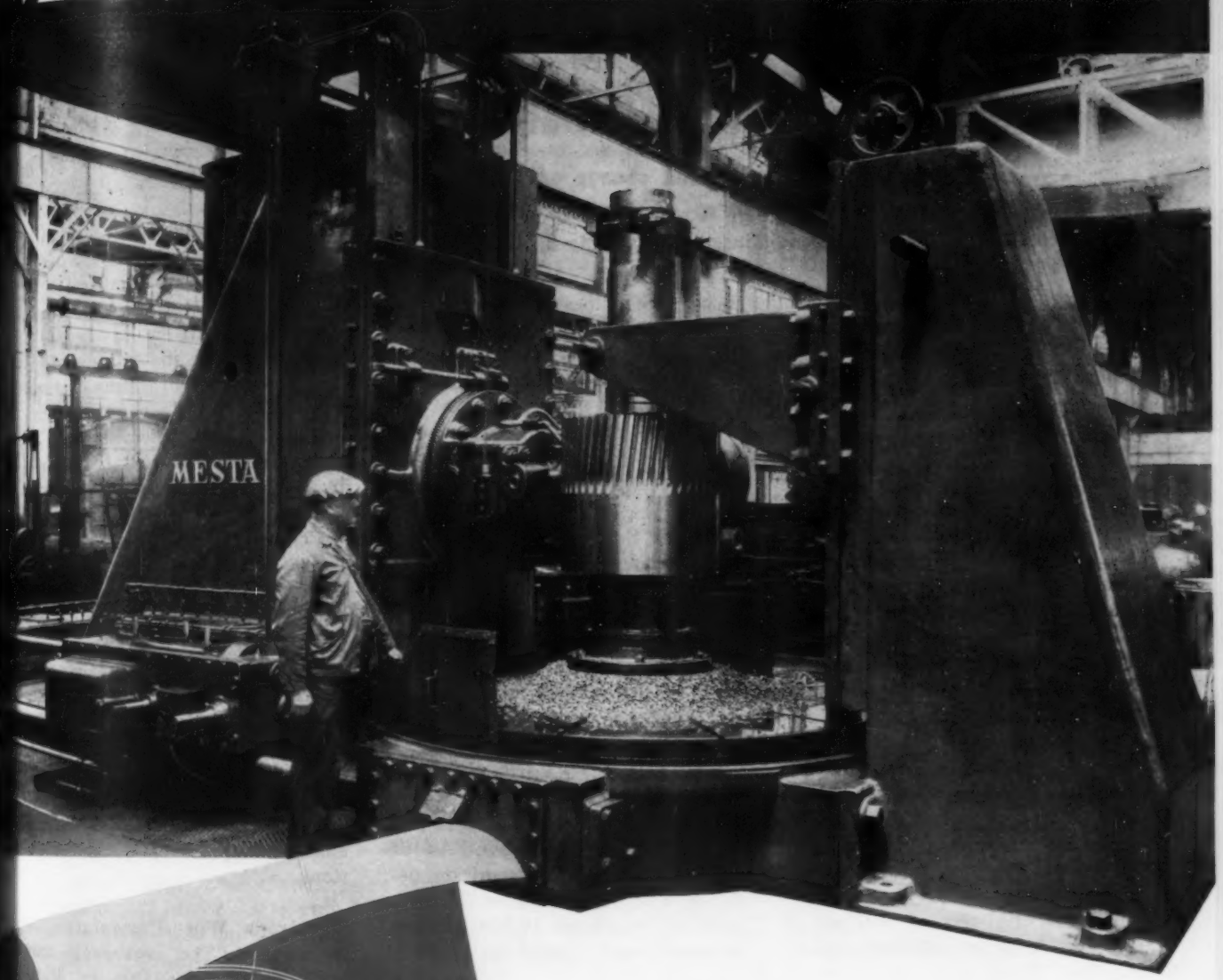
Sales Appointment—MAGNETHERMIC CORP., Youngstown, Ohio, has announced the appointment of Walker & Seed Tool & Engineering Co. as sales representative for northern Indiana, northern Ohio and Michigan. The company is headed by Arthur M. Seed.

Conference Topic—The health of the American worker will be the theme of the twelfth annual CONGRESS ON INDUSTRIAL HEALTH, to be held in the Hotel William Penn, Pittsburgh, Jan. 18-19.

Branch Established — ASKANIA REGULATOR CO., Chicago, has established a branch office in Philadelphia at 1244 Commercial Trust Bldg. Robert J. Kroth has been appointed district manager.

Appointment—The MINE SAFETY APPLIANCES CO., Pittsburgh, manufacturers of safety equipment for industry, mining and agriculture, has appointed Jesse W. Rosenquist as territorial representative in Maine, New Hampshire, Vermont and part of Massachusetts.

MESTA GEAR DEPARTMENTS



Mesta gear cutting equipment includes all the necessary heavy duty machine tools to produce gears up to the largest sizes used by industry. These ruggedly constructed machine tools, including Mesta Gear Planers and Hobbers, are specially designed to enable skilled workmen to produce the most accurate gear teeth possible. A Mesta 16 Foot Heavy Duty Gear Hobber is illustrated.

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Bloated Inventories for War Output

When defense production schedules change or tools are delayed supply of materials dam up . . . Guns for butter is tough substitution . . . Plan machinery discussion—*By W. G. Patton.*

While leaving no stone unturned in their efforts to get more materials for civilian car production, many Detroit executives are privately worried about the inventories they are steadily accumulating for defense. One Detroit source who prefers to remain anonymous puts it this way:

"When we submit schedules for defense materials our requests are realistic and are based on government-approved production schedules. However, as engineering changes are ordered and machine tool deliveries are delayed, these schedules steadily become unrealistic. If we attempt to slow down materials deliveries, our contractors take us to task."

Outbalances Need—"As an example of what I'm talking about, the inventory on one of our contracts is now several millions of dollars. Stock of materials are at least three times as great as they need to be, based on our *present* production prospects. The ratio will increase to four-to-one in 30 to 60 days.

"If you can find an answer to this problem, please let me know," he added wistfully.

Tough Substitution — Problems of replacing civilian production with defense production has been well documented lately. Substituting guns for butter creates a complex industrial problem. In a few instances where the facts are available, bare statistics are frightening.

For example: Ford estimates that during 1952 its sales under government defense contracts will not exceed $400 million. As of Apr. 1, Ford employment on defense will be limited to 3700. A peak of less than 10,000 defense workers is anticipated during 1952.

IN THE COLD: Verner P. Mathews, chief engineer, and Harry Doane, assistant chief engineer check the performance of Buick's new 4-barrel Airpower carburetor in the sub-zero temperatures of the cold room at the company's Flint, Mich., plant. The Airpower carburetor will be introduced on the 1952 Roadmaster.

Ford's estimated 1952 loss in commercial sales will be $1.4 billion and its equivalent payroll reduction will be 38,000 workers.

Focus on Machines—During the coming sessions of the American Society of Tool Engineers to be held in Chicago, Mar. 17 to 21, an entire day will be devoted to a discussion of machine controls and accessories problems. The program has been scheduled in response to the indicated needs of the industrial plants as disclosed by an ASTE survey. (See p. 79.)

Conservation—Prompted by cutbacks in automobile production schedules, the auto industry has saved many pounds of critical materials through the use of less critical substitutes. Statisticians for the Automobile Manufacturers Assn. have estimated that during 1950 the auto industry freed 167 million lb of copper, 48,600,000 lb of aluminum and 10,184,354,000 lb of steel by reduced schedules and changes in materials specifications.

Hotrods Win—Presentation of its award, "The best engineered car," to Chrysler Div. by *Motor Trend* magazine has started a wide open engineering debate in Detroit. While Detroiters are willing to concede the Chrysler is a well-engineered car, some dispute the contention that the Chrysler Fire Power V-8 engine is the best in its class.

One repercussion is already evident. The Chrysler horsepower rating of 180 will be topped by a competitive car—to be announced later in the year.

There is genuine regret in some quarters that the present horsepower race has developed. Much of the fuel economy auto engineers might otherwise have given to motorists is destined to go down the drain for more power. The hotrods are winning the automobile sales competition race.

AUTO CUTS: Sad News in Small Print

Henry Ford II says permission to build 930,000 cars misleads since rations of copper, aluminum will permit only 800,000 . . . Ford in bad spot because of huge sum spent for expansion.

For a while last week, it looked in the big print as if the auto industry would have the right to build 930,000 vehicles during the second quarter. The little print, as Henry Ford II pointed out, would take away many of these cars, since copper and aluminum were to be allocated for only 800,000 vehicles.

At press time, NPA was busy explaining there was some misunderstanding. It was intended that steel, copper and aluminum should be brought into better balance. While NPA was trying to explain it had meant no harm, the auto industry was frankly skeptical about what Washington was actually trying to do.

Expansion Backfires?—The seriousness of the situation is pointed up by Ford. Since World War II ended, Ford has spent $700 million for expansion and modernization. This money came from earnings or surplus. At the 800,000 rate, Ford would operate at less than half the 1951 peak rate.

Defense sales accounted for less than 1 pct of Ford's business last year. Plant capacity is 50 pct above prewar. Its engineering staff has been more than tripled. Because of its tremendous expansion, Ford is particularly hard hit by government controls. In the face of more—and not less control from Washington—the auto industry is being pushed into a very tight and dangerous company.

Unemployment Facts — During the recent discussions at Washington, E. R. Breech, executive vice-president of Ford Motor Co., argued that for each reduction of 100,000 cars and trucks per quarter, there will be corresponding reductions in employment by the car manufacturers of 23,000 workers. An additional 26,000 workers will be laid off by parts vendors, Breech said.

At the same time, Breech argued, reduction of 100,000 cars per quarter would save just 1/3 of 1 pct to a maximum of 2/5 of 1 pct of the country's total quarterly supply of virgin and scrap copper. Thus, the Ford executive contended, a 56,000 cut in employment during the second quarter might lead to a saving—at most—of 4/5 of 1 pct of the country's copper supply.

Price Rises Just in Case

Auto makers are asking for price rises just in case they're needed. Whether they are put into effect when gained is another matter. If National Production Authority authorizes higher production of cars in the future, it will probably take some of the steam out of the pressure to raise the price tags.

Biggest holdback to a price rise is a weakening car market. For the first time in the postwar period it is recognized that higher prices may further soften demand. Customer buying resistance is increasing and is being abetted by unemployment.

Lean Inventories for Cadillac

Talk about bulging car dealer inventories definitely does not apply to Cadillac. The 1952 model production got under way with about 2000 cars in the hands of dealers. Of this number, 900 are demonstrators.

Model cleanup, always a big factor with the industry in the past, was no problem at all. In addition, Cadillac says it has about 80,000 unfilled orders on hand. This compares with 103,266 cars produced during 1951. Introduction of the 1952 models is expected to build the backlog up to a year's supply.

THE BULL OF THE WOODS — **By J. R. Williams**

THAT MONUMENT TH' PRESIDENT PRESERVED OF TH' MACHINE HE STARTED HIS CAREER ON GETS A LOT OF RIBBIN' ON TH' NIGHT SHIFT--BUT TH' BULL HAS PASSED IT A DOZEN TIMES TODAY AN' JUST NOW NOTICED IT!
I GUESS HE'S SO USED TO SUCH POSTURES THAT IT TAKES SOMETHING MOVING TO ATTRACT HIS ATTENTION!
ENGINE OIL
J.R.WILLIAMS
1-18
THE NATURAL
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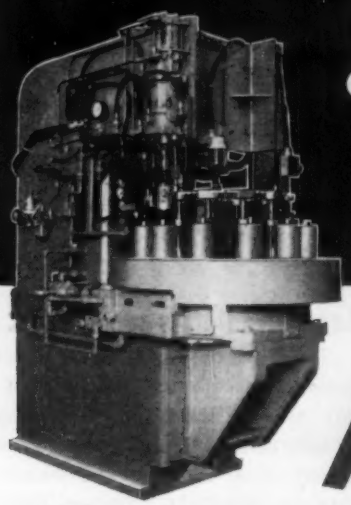

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MULTIPRESS®

has offered the quick solution for others – *FASTER, BETTER and at LESS COST!*

The fast, flexible, oil-hydraulic *power-control* of Multipress makes it quickly adaptable to the widest range of ordnance work —as typified by the list at right. Built in eight basic frame sizes, in capacities of 1 to 50 ton, and with choice of ram control—*plus design that lends to tooling of widest variety*—Multipress can be delivered and on your production line in the shortest possible time. Doing the job faster, better and at less cost! And it gives you a standard production machine that is always easily reconverted to civilian production at any time. Write today for details on Multipress and our facilities for helping you solve your ordnance production problems.

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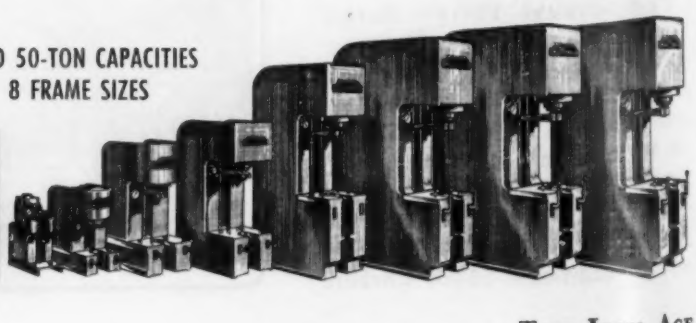
Typical Ordnance Items

PROJECTILES 20 TO 155 MM.	MINES	CARTRIDGE CASES
FIBRE CONTAINERS	BOMBS	PERCUSSION PRIMERS
METAL CONTAINERS	SIGNALS	FUSES
CANVAS BAGS	BURSTER TUBES CASINGS & IGNITORS	ROCKETS

Typical Production Operations performed on this Ordnance Work

BANDING	SIZING	INSERTING
MARKING	PRESS FIT ASSEMBLY	BLANKING
STAKING	CRIMPING	DRAWING
SWAGING	FORMING	TRIMMING
PIERCING	FLARING	PREFORMING
ASSEMBLY	CLINCHING	TESTING (HYDROSTATIC)
COMPACTION	RIVETING	STAMPING
LOADING	NECKING DOWN	CLAMPING

1 TO 50-TON CAPACITIES
8 FRAME SIZES



DENISON Hydr OIL ics

Try Iron Recovery From Cinders

Extraction of Fe from iron pyrites after sulfur removal is promising . . . Pacific States Steel will try the sinter in its openhearths and electric furnaces—*By K. T. Reinhardt.*

Metallic-hungry steelmaking furnaces of the West may soon be fed a new diet.

Two enterprising young men have begun where others gave up 20 years ago in attempts to recover iron from iron pyrite cinders from which Stauffer Chemical Co. has extracted most of the sulphur.

An estimated 1 million or more tons of these tailings are piled up at Martinez, Calif. Mountain Copper Co., which mines the pyrites in Shasta County, Calif., owns the residue and may put in equipment to recover the copper and zinc content of the material.

New Process—Experiments carried out from 1925 through 1933 failed to prove iron recovery economically profitable. However, these most recent pilot plant studies show considerable promise and Pacific States Steel Corp. at Niles, Calif., will in the near future try in both openhearths and electric furnaces 100 tons of sinter made from the tailings.

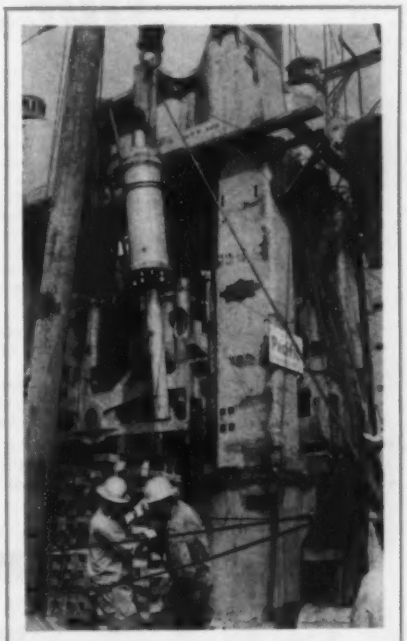
Earlier trials attempted to produce sponge iron, but present experiments are limited to coming up with high Fe sinter for further reduction in furnaces. Tailings are put through a rotary horizontal kiln and brought to an incipient fusion point at 1900° to 2000°F.

Analysis — Typical analysis of the resultant sinter is: Fe 64.8 pct; silica 6.8; alumina 2.7; phosphorous 0.01; Sulphur 0.25; and copper 0.23. Pilot runs on this sinter in an electric furnace with introduced carbon produced: Fe 94.8; sulphur 0.05; silicon 0.16; and copper 0.23.

It is estimated that cost of the sinter will approximate that of iron ore delivered to the San Francisco Bay Area which is now approximately $10.00 per gross ton.

With present facilities in the Bay Area production would be limited to 100 tons per day, but if Pacific States Steel finds the material commercially acceptable additional kilns would be put into service for more production.

Scrap Jitters — With the news that eastern openhearths were being closed down because of a lack of scrap, local steel makers began worrying about the possibility of the Government allocating western scrap to the blighted area. Most took courage from the fact that whatever could be squeezed from the western turnip would be but a drop in the openhearths of major producing areas. There is no evidence of any scrap glut in western yards, which would seem to make allocation fears groundless.



FINISHING UP: Giant hydraulic press nears completion at Lockheed Aircraft Corp.'s Burbank, Calif., plant. Press is as high as a 4-story building and weighs more than 1185 tons.

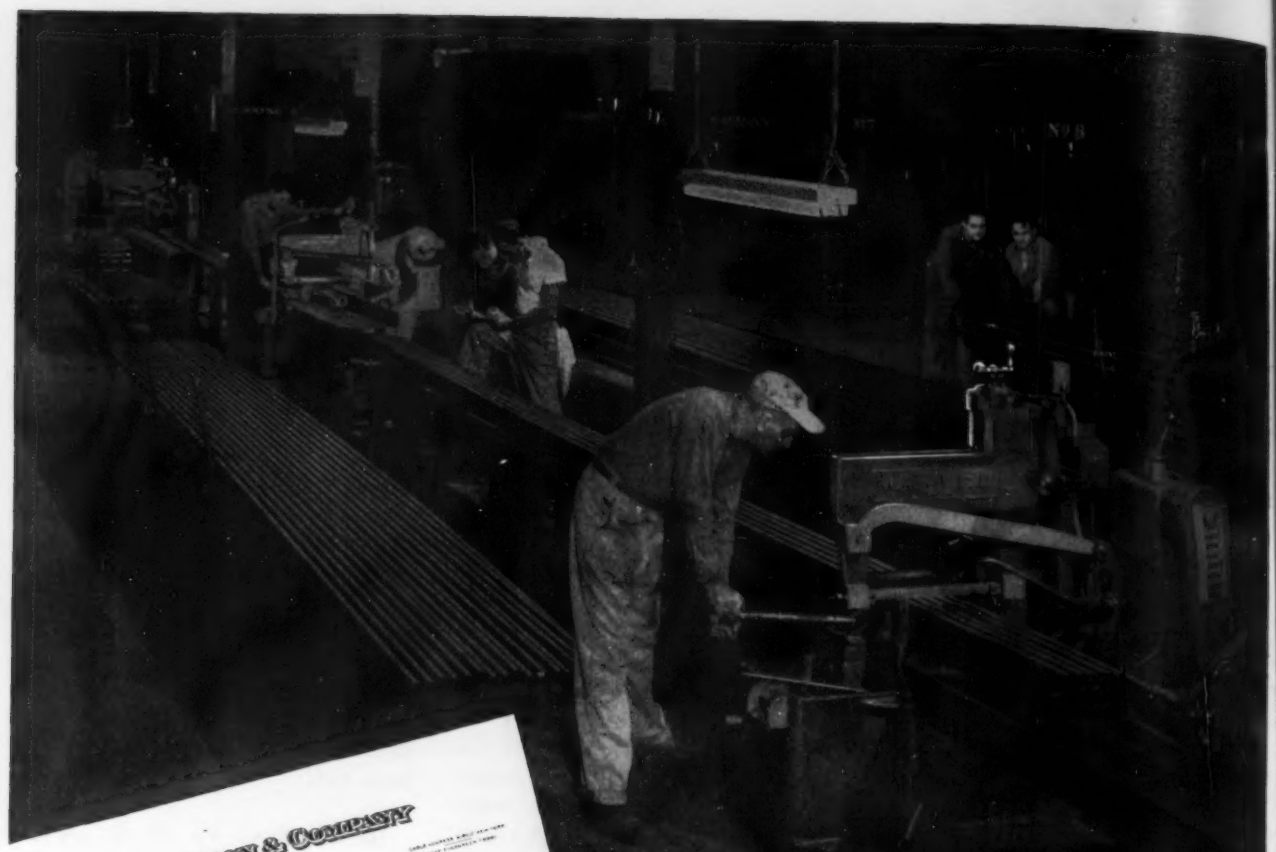
A Little Previous — Probably there is no connection between the walkout last week of workers at the Torrance, Calif., plant of Columbia-Geneva Div. of U. S. Steel Corp. and current wage negotiations. However, it may indicate the temper of the men. Two rolling mill men were discharged for continuous failure to carry out job assignments and the entire crew of 11 others walked out. Work stoppages spread and at the end of last week more than 4000 tons of steel had been lost.

Better News — U. S. Steel's Geneva, Utah, plant established a production record in 1951 by exceeding 1950 output by 63,553 net tons of ingots and pouring 1,490,631 tons.

Alden G. Roach, president of the Columbia-Geneva Div., expects 1952 production to hit 1.6 million tons and that demand will equal or exceed maximum production capacity in the West. Geneva's tenth openhearth will be in operation within a month or two.

It's Working — Last week the electric furnace of Seidelhuber Steel Rolling Mills got into production after a few false starts. Frank Seidelhuber, Jr., president, reports that there has been less difficulty with scrap than they had expected. He is negotiating for 40,000 tons of offshore scrap at about $40 per gross ton. Previously 6000 tons had been refused when offered at $52 per ton.

Mr. Seidelhuber is one of the few metalworkers who refuses to accept shortages of materials as handicaps to production. So far as the materials needed in his production of water heaters are involved, he states, "There are no shortages. We merely have to work harder to get the material."



E. D. GIBERSON & COMPANY
IRON AND STEEL
GENERAL OFFICES AND WAREHOUSE
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September 30, 1948

Armstrong-Blum Manufacturing Co.,
Chicago, Illinois

Gentlemen:

For almost half a century as direct distributors of Boiler Tubes, Condenser Tubes in seamless steel, electric welded steel and stainless steel, as well as seamless and welded Mechanical Steel Tubing, Seamless Steel Pipe, Stainless Steel Pipe and Tubing, we have out in our warehouse many million feet of Tubular Steel Products.

The nature of our business necessitates both speed and accuracy in multiple cutting to exact lengths required by customers. When we decided recently to install three more 9A MARVEL Heavy Duty Automatic Hack Saw Machines, it was with full knowledge of their efficiency.

We can assure you of our entire satisfaction with their operation and regard them as valuable additions to our equipment.

Yours very truly,
E. D. GIBERSON & COMPANY, INC.
E. D. Giberson
President

Another Tubing Warehouse "Goes MARVEL"

Warehouses that are not equipped with proper sawing machines find that the cutting of steel tubing (especially the stainless types) is a difficult and costly job. But E. D. Giberson & Company, New York, have cut off millions of feet of all types and sizes of steel tubing to accurate lengths, economically and without difficulty, due to the fact that they have long been properly equipped with MARVEL SAWS. And because they have found MARVEL SAWS so trouble-free, so reliable, so economical to operate and so universally suited to all their cutting-off jobs, they have recently added this row of three new MARVEL No. 9A Automatic Hack Saws. With this additional equipment, they have expanded their facilities and can more promptly serve their fast-growing list of satisfied customers with steel tubing of all types and sizes, "cut to customer's specified lengths".

The local MARVEL Field Engineer will be glad to study your range of cutting-off work—whether it be in pipe, structural shapes, bars, or the toughest and largest alloy billets—and will then make recommendations on how you can improve your cutting-off operations to reduce costs and increase man-hour output.

Just write us on your letterhead: "Without cost or obligation on our part, send your local Field Engineer to look over our cutting-off operation".

MARVEL Metal Cutting SAWS
Better Machines-Better Blades

See our CATALOG in SWEET'S FILE

ARMSTRONG-BLUM MFG. COMPANY
5700 BLOOMINGDALE AVENUE "The Hack Saw People" CHICAGO 39, U.S.A.

Tool Users Seek Simplified Controls

Simpler controls on machines sought to cut down skill needed by operators . . . Workers sometimes dull drive to more productivity by holding down output per hour—*By G. Elwers.*

Further information on the survey of machine tool users by the American Society of Tool Engineers indicates industry has great interest in simplified machine tool controls. According to the ASTE, what this indicates is a desire to reduce the amount of skill needed by machine tool operators.

One-half of those responding to the survey wanted simpler, more foolproof controls. One-third mentioned more versatility in controls as being particularly desirable. Less than one-third of the replies actually said they would like to be able to obtain lower-cost controls.

Almost Unanimous—First place in the survey is still held by productivity, which more than 90 pct of survey replies mentioned as the one point where machine tools need most improvement.

In answer to this, one machine tool builder has suggested that what is really needed most is an entirely new machine. It would be designed, not to cut metal, but to persuade machine tool operating personnel to make fullest use of the productivity of the machines they now operate.

Hold It Down—Many builders of automatic and semi-automatic machine tools will not quote the output of their machines in terms of parts per hr. They will promise a given cycle time, but have found through sad experience that they can't be sure the machine's operator will put it through the maximum number of cycles each hour.

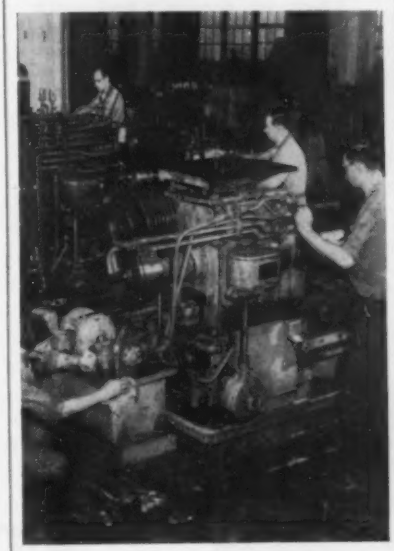
Probably every single machine tool builder can quote examples in which labor has deliberately held down the productivity of a machine tool. This is most true in Detroit, but examples occur regularly in non-automotive plants.

Below Capacity — One typical example involves two automatic lathes, which in tests in the builder's shop — made an average 135 parts per hr. Installed in the customer's plant, the machines averaged only about 105 parts per hr, and the customer complained.

A service representative looked over production records for a 3 week period. He found hourly production averaged, from shift to shift, 105.1, 104.9, 105.0, 105.1 . . . and so on for 3 weeks.

Done on Purpose—These figures made it obvious why production was low. The only way hourly production averages could be so closely in line for shift after shift would be if the operators were deliberately trying to hold an output below tool capability.

Actually, though, the industry is making every effort to increase the productivity of its equipment. Every new model is better than the last, and no builder is slacking on development.



OUT OF STORAGE: Aircraft machine tools from the Air Force reserve pool are reconditioned on an assembly line basis at Buick. The company has received about 500 of these machines, wants 2700 more to equip three new jet plants.

No Shortage—In explaining the drags on a rapid increase of machine tool production, shortages of components frequently are mentioned. Electric motors and controls, and bearings, have been mentioned.

Actually, there is no real shortage of anti-friction bearings any more, and these should not be a deterrent to expanding machine tool production. Some builders report, too, that the situation in electric motors is easing now.

Misleading Estimates — Some bearing troubles were caused by the difficulty of predicting in advance how many machines of what style and size the defense program would need. A builder would order bearings based on his estimate of sales, then find more of certain sizes of machines were being ordered than he had anticipated.

Often this caused dislocations in the bearing supply situation for some builders, and temporary delays. But there is no real shortage of anti-friction bearings.

Levelling-Off—One and one-half years ago the machine tool industry backlog stood at 5 months' shipments. In the intervening months, the backlog has risen to almost 24 months, then dropped back a little.

While the volume of new orders in the past 2 months has dropped somewhat, it appears to be more of a levelling off process rather than the beginning of a real decline in demand.

Why run around in circles— to find the Right Circular Saw?

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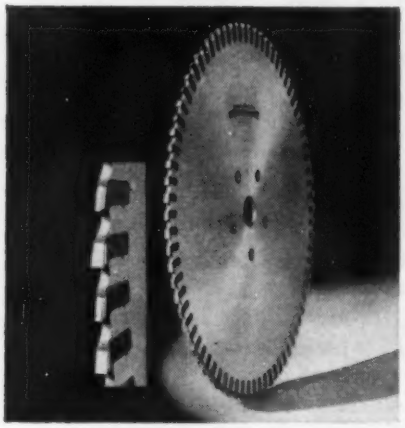
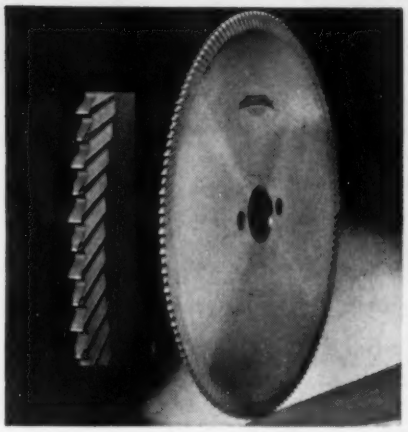
SIMONDS MAKES ALL THREE TYPES OF CIRCULAR METAL CUTTING SAWS. So you can be sure that SIMONDS will give you *the right saw for your job* . . . for any type of machine. See your Simonds Distributor *today.*



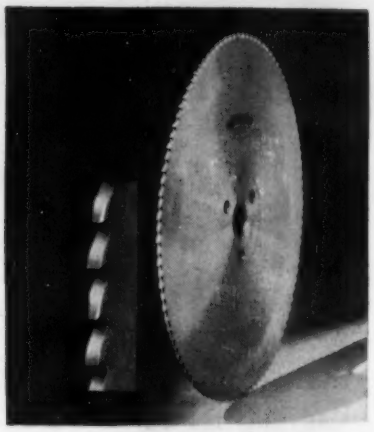
INSERTED TOOTH

For heavy production cutting, Simonds I. T. Saws are tops. Alternating square and beveled teeth "tri-vide" chips for easy cutting and clearance. An individual wedge securely anchors and aligns each tooth in the tough saw plate. What's more, this saw has maximum clearance for cool, free cutting . . . will stand an extremely high rate of feed . . . and teeth can easily be replaced singly or in complete sets right in your own plant by anyone of average mechanical ability.



SEGMENTAL

Where you require a finer tooth saw or especially smooth cuts on production work, *this is your saw.* Long-lived high-speed steel toothed segments are securely held in a tough alloy steel plate by a special tongue and groove design. Teeth are alternately square and beveled for easy cutting and clearance of "tri-vided" chips. Simonds special grinding provides ample clearance directly below the cutting points, insuring free, cool operation under all conditions. Sharpening can be done on any automatic grinder.



SOLID TOOTH

Clearance ground and furnished in High Speed, Si-Maloy (Patented), or Semi-High Speed Steel, Simonds Solid Tooth Saws are recommended for general shop cut-off requirements, for use on smaller automatic cut-off machines and for cutting operations where kerf is an important factor. Tooth design is determined by and especially suited for the application. Simonds' own steel, plus skilful heat treating and accurate grinding, insure long, dependable, trouble-free service.

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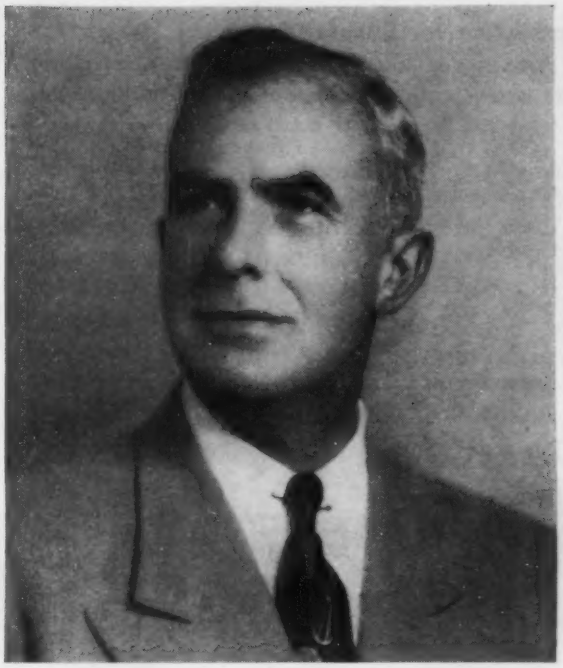
The Iron Age SALUTES



Kenneth R. Beardslee

He's helping guide his firm in its merger with General Electric . . . Hobbies are golf, shooting.

IN the depth of the depression Ken Beardslee took a calculated risk. He switched from purchasing to sales. That switch led him to the top job in one of the biggest producers of cemented carbides, Carboloy Co., Inc.

Folks around Pittsburgh remember Ken for the many successful applications of cemented carbide dies he introduced in wire, bar and tube mills. From Pittsburgh he moved to Carboloy's home office at Detroit as sales manager. There he grew with the booming specialized metals industry, moving steadily up to the position of chief executive.

Quiet, capable and impeccably neat, Ken has the knack of picking good assistants and giving them responsibility. His primary interest is the growth of his company and development and advancement of its personnel.

If you asked Ken his method for assuring a dynamic development program, he'd tell you simply—laboratory research, engineering appraisal, commercial development, market expansion. Facts and figures prove his method sound.

As head of Carboloy Dept. of General Electric Co. he's using his organizational ability to help guide the merger of his company into General Electric and its expansion into new metallurgical fields.

Born a farm boy in New Jersey, Ken enjoys the outdoors. Hobbies are golf (he shoots in the middle 80's) and bird hunting. He's active in management, social and civic organizations, but his chief interest is watching his company grow.

Beseler "Throws Light" ON 50% TIME SAVINGS

How the Charles Beseler Company, Newark, New Jersey, eliminated 84 fasteners and cut assembly time and cost in half on new opaque projector assembly

It used to take 168 screws, nuts and washers to attach the cover panels to the base frame of the new Beseler opaque projector. That was before "U"-Type SPEED NUTS were tried. Now it takes only 84 screws and SPEED NUTS to do this job.

By making this switch, Beseler picked up a 5% material savings, reduced handling, stocking and ordering of parts and made a substantial 50% saving in assembly time.

"U"-Type self-retaining SPEED NUTS are pre-assembled on the base frames of projectors—ready for simple attaching of panels as frames come down assembly line. Time required for this step was cut from 13 minutes to 6, and the production rate was increased to a new high.

There is no better time than now to take a close look at *your* fastening costs. Savings here often balance rising costs elsewhere. Your Tinnerman representative will supply helpful details. Call him in—and write now for your copy of Savings Stories, Vol. III. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners, Limited, Hamilton. In Great Britain, Simmonds Aerocessories, Limited, Treforest, Wales.

"U"-Type SPEED NUTS are shown on flange of frame—in screw-receiving position, ready for blind attachment of panels. No extra parts handling. Screws are easily inserted and driven from assembly side of projector.
TINNERMAN Speed Nuts®
*Trade Mark Reg. U.S. Pat. Off.
FASTEST THING IN FASTENINGS

The Iron Age INTRODUCES

E. A. Schwartz, appointed assistant vice-president in charge of steel operations, REPUBLIC STEEL CORP., a position formerly held by **M. E. Goetz,** who now becomes manager of the Cleveland district.

Harvey T. Harrison, elected president, ALLOY CASTING INSTITUTE, Mineola, N. Y.

John L. McMurphy, appointed general manager, plastics department; **Sam L. Brous,** general manager, chemical materials department; **James W. Raynolds,** marketing manager, chemical division; and **Dr. Alphonse Pechukas,** engineering manager, chemical division, GENERAL ELECTRIC CO., Pittsfield, Mass.

John R. Hoover, elected president, B. F. GOODRICH CHEMICAL CO., Cleveland. He succeeds **William S. Richardson,** vice-president of the parent company.

Dudley B. Robinson, elected vice-president in charge of sales, TORRINGTON MANUFACTURING CO., Torrington, Conn.

A. J. Fisher, appointed plant general manager, BETHLEHEM STEEL CO., Bethlehem, Pa. Mr. Fisher succeeds **R. E. Hough** who has retired.

Cecil M. Peter, joins ANGEARS, INC., Detroit division as vice-president.

Dr. Karl T. Compton, elected member of the board and **General Lucius D. Clay,** member of the financial policy committee, GENERAL MOTORS CORP., New York. Dr. Compton is chairman of M. I. T. Corp., and General Clay, chairman of the board of Continental Can Co., is a director of General Motors.

Charles B. Tillson, Jr., appointed assistant superintendent, Crucible Mine, CRUCIBLE STEEL CO. OF AMERICA, Crucible, Pa.

W. W. Deal, appointed manager, New York district sales office, American Steel & Wire Division, U. S. STEEL CO.; **L. L. Anderson,** manager of sales, and **R. W. Drake** transferred to Philadelphia as assistant manager of sales.

Lawrence Wilkinson, succeeds **J. S. Snelham** as vice-president in charge of finance, CONTINENTAL CAN CO., New York.

Charles B. Cushwa, Jr., elected president, COMMERCIAL SHEARING & STAMPING CO., Youngstown, Ohio. He succeeds his father, whose death left the position vacant.

W. A. Hibler has joined TUBE CITY IRON & METAL CO., Glassport, Pa., as vice-president.

Dr. William A. Thomas, joins engineering staff, THE ELECTRIC PRODUCTS CO., Cleveland.

A. A. Archibald, named director of special products and services, JONES & LAUGHLIN STEEL CORP., **F. T. Barton,** named general manager and **H. W. Lees,** director of sales, container division. **A. W. Herron, Jr.,** general manager, and **D. L. Ande,** manager of sales, warehouse division. **P. P. Somerville,** general manager, and **D. J. Henecker,** manager of sales, wire rope division. **H. W. Maskrey,** general manager, and **Blair Rainey,** manager of sales, electricweld tube division. **G. W. Gottschalk,** appointed assistant vice-president traffic and

Turn Page

WILLIAM A. EHRESMAN, named director of purchases, Budd Co., Philadelphia. Mr. Ehresman succeeds Francis S. White who retired.

C. H. WILLIAMS, appointed assistant executive vice president, engineering and raw materials, U. S. Steel Co., Chicago.

DONALD ROLLINS, appointed assistant vice-president, engineering, U. S. Steel Co., Pittsburgh.

For Fast
Dependable
WAREHOUSE
SERVICE

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- COLD FINISHED BARS—Rounds Hexagons, Flats and Squares
- ALLOY COLD FINISHED BARS
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- ABRASION RESISTING PLATE
- HOT ROLLED AND COLD ROLLED SHEETS
- HOT ROLLED STRIP
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- WIRE ROPE AND FITTINGS

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Personnel

Continued

transportation division. **P. L. Tietjen,** manager, traffic and transportation division, and **C. F. Coombs,** assistant manager. **G. E. LeVeque,** becomes manager, Minnesota ore division, and **H. F. Kullberg,** general superintendent. **L. J. Reed,** becomes director, plant development.

William F. Cassedy, Jr., elected president, AIRCRAFT RADIO CORP., Boonton, N. J. Mr. Cassedy succeeds **Lewis M. Hull,** who will become chairman of the board.

Albert E. Forster, elected vice-president and member of executive committee, HERCULES POWDER CO., Wilmington, Delaware. **Paul Mayfield,** succeeds Mr. Forster as general manager, naval stores department.

Vernon N. Ferguson, assistant chief industrial engineer, Texas division, North American Aviation, Inc., appointed chief industrial engineer, TEXAS ENGINEERING & MANUFACTURING CO., INC., Dallas.

Alvin A. Corey, succeeds **Grover C. Hansen** as manager, sulfuric acid production, E. I. DU PONT DE NEMOURS & CO., Wilmington, Delaware. Mr. Hansen has retired after more than 40 years with the department.

William H. Clark, appointed general purchasing agent, AMERICAN LOCOMOTIVE CO., Schenectady, N. Y.

M. G. Purpus, appointed sales manager, special products division, BLACK, SIVALLS & BRYSON, INC., Kansas City.

T. F. Fleming, appointed general manager, metallurgical department, MORRISON ENGINEERING CO., Cleveland.

L. B. Kuhns, succeeds **John W. Schreiber,** who has retired, as chief construction engineer, ALCOA CO. OF AMERICA, Pittsburgh.

I. J. Paul, appointed tin mill division superintendent; **Robert W. Holman,** division superintendent of maintenance; and **Henry S. Gordon,** chief engineer, Gary Sheet and Tin Mill division, U. S. STEEL CO., Chicago.

M. NIELSEN, elected assistant vice-president, Babcock & Wilcox Co., New York.

JAMES N. CRAWFORD, appointed assistant to the president, Affiliated Gas Equipment, Inc., Cleveland.

R. E. WALDO, assumed the position of general manager, new departure division, General Motors Corp., Bristol, Conn.

ROBERT A. WEISSE, appointed assistant sales manager, Kaydon Engineering Corp., Muskegon, Mich.

QUENCH-TEMPER TREATMENT

The Iron Age
FOUNDED 1855
Technical Articles

Improves Nodular Irons

by J. E. Rehder
Foundry engineer
Physical Metallurgy Div., Mines Branch
Dept. of Mines and Technical Surveys
Ottawa, Ont.

Nodular irons require at least ½ hr 50°F above critical temperature range. Predominantly ferritic structures may require longer and/or higher temperature soaking. Tempering at 1000°F produced 142,750 psi tensile with 290 BHN in a 3.10 pct carbon composition.

In the cast irons where silicon is present, there is a critical temperature range[1,2], rather than a single critical temperature. The influence of silicon, manganese and other elements on the location of this range is currently being studied. For practical purposes, and for application to nodular irons of commonly used composition, silicon has the most important effect.

The top of the critical temperature range, from above which quenching must take place for full hardening, rises linearly from about 1390°F at 0.80 pct silicon to about 1540°F at 3.20 pct silicon. The bottom of the critical temperature range is less strongly affected. It is of minor importance in hardening except as an upper limit of the draw or tempering temperature. It is approximately constant at about 1330°F.

There has been considerable literature on the hardening, or quenching and tempering, of gray cast irons. They have had considerable commercial use, as in cylinder liners.

Some work has been done on quenching and tempering of black-heart malleable iron, and a recent study[3] has included data on mechanical properties. No conclusions on properties would seem justified at the moment.

In 1950[1], a study of the heat-treatment of two nodular irons was reported. A standard Jominy end-quench specimen was included. The maximum hardness obtained was about 57 Rc. This agrees with the writer's work, where a maximum hardness of 56 to 58 Rc has been obtained-as-quenched-on a large number of different nodular iron heats. The Jominy end-quench results reported showed that nodular irons have very good hardenability. This would be expected from the relatively high silicon content.

To obtain maximum as-quenched hardness and fully martensitic structure, it is essential that the iron be heated to a temperature above the top of the critical temperature range. There it must be held long enough to complete re-solution

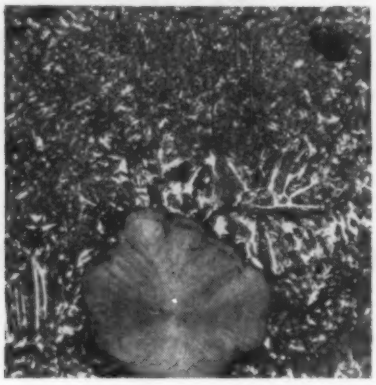


FIG. 1—Inadequate soaking time results in incompletely re-dissolved structure. This specimen was oil quenched only 15 min at 1550°F, drawn 3 hr at 1050°F. Ultimate tensile, 103,900 psi; yield, 67,500 psi; elongation, 7.5 pct; 229 BHN. Etched, 2 pct nital. 200X.

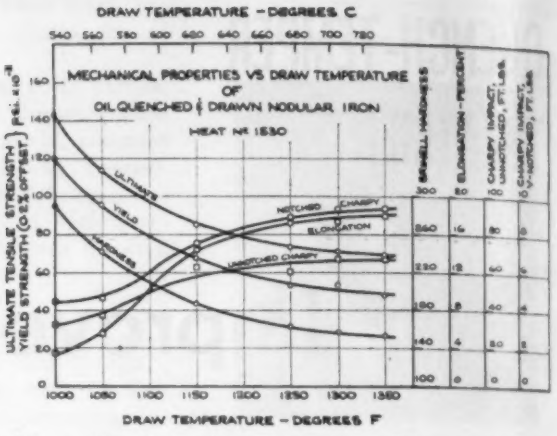


FIG. 2—How tempering temperature affects mechanical properties of a quenched nodular iron.

of pearlite and especially ferrite. This involves knowledge of the composition, especially silicon content, so that the critical temperature range will be known.

Pearlite and other fine carbide-containing structures such as bainite and martensite re-dissolve rapidly on re-heating, but ferrite is relatively slow to re-dissolve. It dissolves more slowly as the silicon content of the iron increases. If the microstructure of a nodular iron to be hardened contains an appreciable amount of ferrite or is predominantly ferritic, ample soaking time above the critical temperature range must be allowed. Preferably, the soaking temperature should be 50° to 100°F above the critical temperature range.

If the superheat is only 50°F, at least 1 hr at temperature after thermal equalization should be allowed for complete re-solution of ferrite. If an incompletely re-dissolved structure is quenched and tempered, a serious loss in yield strength will result.

Low ferrite content advisable

This is shown by keel block coupons of a nodular iron, ferritic before hardening. These were held 50°F above the top of the critical temperature range for only ¼ hr before oil-quenching and subsequent tempering. The resulting microstructure is shown in Fig. 1. The yield strength (at 0.2 pct offset) is about 25,000 psi below that to be expected from a fully hardened sample of the same iron at the same tempered hardness.

It is wise, therefore, to start with a matrix low in ferrite content. Otherwise, complete re-solution of ferrite by sufficient homogenization above the critical temperature range is required.

These considerations are particularly important when hardening nodular or other cast irons by means of induction or flame heating. Rates of temperature rise in the cases are high and time at temperature is usually short. Time-temperature cycles suitable for steels may not be sufficient for nodular irons. Either an original matrix predominantly pearlitic should be used, or the time at temperature extended.

In many nodular irons to be quenched and tempered, some primary cementite may be present. The iron should be heated to 1700° to 1750°F for a sufficient length of time to decompose the primary cementite. Cooling in the furnace 50° to 75°F above the top of the critical temperature range is next, followed by quenching.

Maximum hardness 57Rc

As mentioned above, maximum hardness in quenched nodular irons is about 57 Rc. Microhardness surveys have been made of quenched samples and others with a mixed ferrite-martensite matrix, caused by quenching from within the critical temperature range on re-heating. These surveys show that the martensite has a hardness of 830 to 850 Knoop, corresponding to 63 to 65 Rc. This indicates that the matrix hardens fully. The lower hardness of the iron as a whole is due to the approximately 3 pct of dispersed free graphite as nodules.

It is advisable to quench from a temperature as close to the top of the critical temperature range as practicable. This not only decreases quenching stresses, but also controls matrix carbon content. In the cast irons, with an excess of free graphite, the matrix is always near saturation with respect to carbon content. If quenching is performed from a temperature considerably above the top of the critical temperature range, the carbon content of the matrix may be sufficiently high to cause difficulty. Dimensional control and quench cracking may result, the latter especially in more complicated shapes.

Because of the relatively high hardenability conferred by silicon and especially if nickel is present, the quenching medium must be chosen with care. An oil quench will usually be found

satisfactory. For thinner sections, especially where silicon and nickel contents may be high, a slower quench may be necessary. This will avoid retention of austenite as quenched. For very heavy sections, a water quench may be possible or necessary. However, the writer has no data on quenching of sections heavier than about 2 in.

When a quenched nodular or cast iron is re-heated for tempering, two processes take place at rates depending on the silicon content and temperature. One is the normal tempering of martensite. The other is the graphitization of the martensite or its tempered products. In the range of hardnesses of greatest commercial interest these processes proceed simultaneously. Each contributes its own softening effect. The tempering of the martensite is presumably identical with that taking place in steels.

The secondary graphitization is characterized by a multitude of very fine spots of free graphite. This is characteristic of the graphitization of a previously martensitic structure. It has been described in some detail at various times in connection with pre-quenched malleable irons. It has not been possible to determine whether these finely precipitated graphite spots are spherulitic although some appear to be.

Superimposing graphitization on the tempering of the martensite causes softening to proceed rapidly as tempering temperatures approach the bottom of the critical temperature range. The hardness is then lower than that of a steel drawn under the same thermal conditions.

Lowering of properties not severe

One of the characteristics of fully annealed, pre-quenched malleable iron having the graphite present as very fine nodules is drastically lower ductility and appreciably lower strength than iron annealed manually (5 to 7 pct v. 18 to 20 pct elongation). Therefore it is not surprising that the ductility of a nodular iron quenched and tempered to a completely ferritic matrix is lower than that of the same iron annealed in the conventional manner. However, since only a portion (approximately one-sixth) of the total free graphite is distributed in this way in a quenched and tempered nodular iron, the lowering of mechanical properties is not severe.

On re-heating a quenched and tempered nodular iron to 1750°F, the small graphite spots do not completely re-dissolve, even after holding at temperature for 1 hr. This may be due to the fact that carbon will re-dissolve from all available surfaces of graphite. The larger nodules present tend to protect the smaller ones from complete re-solution.

The graphitization of the tempering product of martensite takes place selectively with respect to the original dendritic structure. It proceeds much more rapidly in the dendrite cores. At the higher tempering temperatures, the last traces of ungraphitized material are in the interdendritic spaces. In nodular irons they almost always surround the dark inclusions, which are believed to be some form of magnesium sulphide. This behavior is identical with that in all cast irons being annealed in a normal manner.

TABLE I

MECHANICAL PROPERTIES OF HEAT 1530

Tempering temperature, °F	Ultimate tensile strength, psi	Yield strength, psi	Elongation-pct	Brinell hardness	Charpy Impact, ft-lb	
					Un-notched	V-notched
1350	89,650	47,700	18.0	153	67	9.3
1300	71,200	52,750	17.0	156	67	9.3
1250	73,650	53,350	17.0	162	60	6.8
1150	85,250	67,250	14.5	186	63	7.5
1050	113,600	95,250	5.5	241	37	4.6
1000	142,750	119,600	4.0	290	32	4.4
Air cooled	127,500	80,300	6.0	253	35	12.8
Full annealed	68,000	47,350	24.0	143	117	12.8

Table I and Fig. 2 are results of mechanical tests on a series of keel block coupons. These were oil quenched for 1 hr at 1575° and subsequently drawn or tempered 3 hr at each of several temperatures. The coupons were treated in pairs. The results given are in each case the average of two values, which were closely similar.

Yield strengths reported at 0.2 pct offset

Impact test results are the average of five samples each. Included in Table I are mechanical properties of two sets of coupons from the same heat. One pair was air-cooled from 1575°F to produce a pearlitic matrix. The other pair was cooled from 1575°F at 20°F per hr to produce a completely ferritic matrix. The test bars machined from the coupons were of 2-in gage length, 0.505-in. diam in the gage length. They were provided with dumb-bell ends for use with self-adjusting grips. The yield strengths reported are at 0.2 pct offset.

The iron was made in an induction furnace, the magnesium being introduced as magnesium ferrosilicon containing about 10 pct magnesium and 2 pct calcium. The composition is given in Table II.

The keel blocks from which the coupons for these tests were cut weigh about 25 pounds, as cast. They are about 6½ in. long by 4¼ in. wide. A head 2½-in. deep is provided for feeding, leaving two legs 1¼-in. thick and 2¼-in. high.

TABLE II

CHEMISTRY OF HEAT 1530

Total carbon, pct	3.10
Silicon, "	2.90
Manganese, "	0.33
Sulphur, "	0.015
Phosphorus, "	0.026
Magnesium, "	0.062

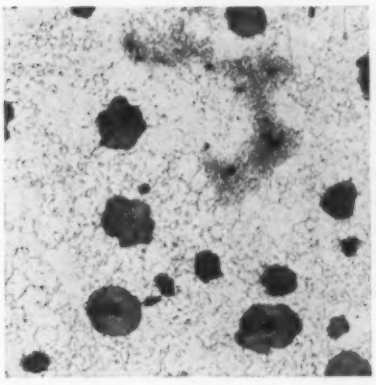


FIG 3 — Specimen of nodular iron, oil quenched and tempered 3 hr at 1250°F. Etched, 2 pct nital. 100X.

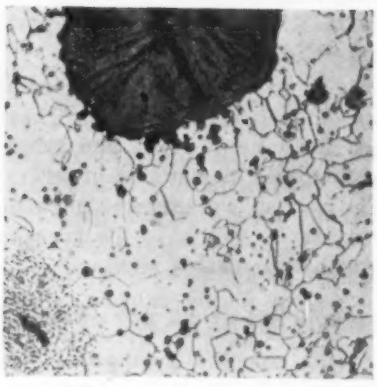


FIG. 4 — Showing fine, secondary graphite in more detail. Specimen was oil quenched and tempered 3 hr at 1250°F, like that in Fig. 3. Etched, 2 pct nital. 500X.

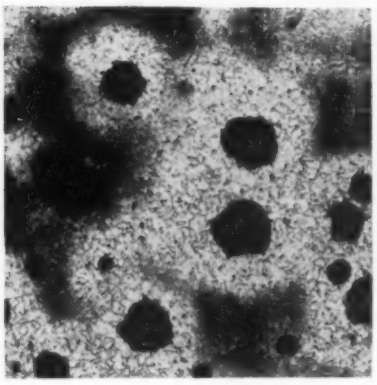


FIG. 5 — Specimen of nodular iron, oil quenched and tempered 3 hr at 1150°F. Etched, 2 pct nital. 100X.

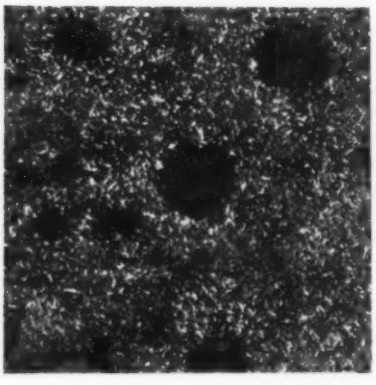


FIG. 6 — Specimen of nodular iron, oil quenched and tempered 3 hr at 1000°F. Etched, 2 pct nital. 100X.

From the bottom of each of these legs a coupon is cut, 6¼-in. long by 1¼-in.

Tensile test bars are machined from these coupons. All heat-treatments are performed on coupons before machining into test bars. Hardness surveys show that through-hardening was obtained.

The relationship between mechanical properties and tempering temperature shown in Fig. 2 is typical of quenched and tempered nodular irons. However, the relationship will not be correct for all nodular irons. The hardness and strength obtained at a given tempering temperature will depend on the chemical composition of the iron.

Graphitization is faster

Microstructures of representative quenched and tempered bars are shown in Figs. 3 through 6. In Fig. 4 is shown in more detail the fine secondary graphite obtained in the tempered structure.

Because secondary graphitization is superimposed upon the tempering of martensite, the graphite precipitation centres are very numerous. This is due to the initial formation of martensite. Graphitization rates are much more rapid than in malleable irons. For this reason, the presence and amount of accelerators or retardants of graphitization has an important effect on the rate of softening during tempering.

The effect of silicon content is self-evident. Other factors remaining the same, higher silicon requires lower tempering temperature or shorter tempering time for a given hardness. It should be remembered that lower silicon content also results in less hardenability. Nickel and, to some extent, copper act similarly, with less effect.

Manganese is a retardant of secondary graphitization, and in nodular irons nearly all the manganese present is effective. This is due to the low sulphur content and the relatively small amount of manganese neutralized as manganese sulphide.

Phosphorus also a retardant

Phosphorus is also a retardant, as was shown in a study of its effects in nodular irons[5]. However, the important influence, especially in the quenched and tempered condition, is the drastic lowering of impact strength and ductility as phosphorus content increases. This must be taken into account in any comparison of properties of different nodular irons. Doubling the phosphorus will halve elongation and impact strength.

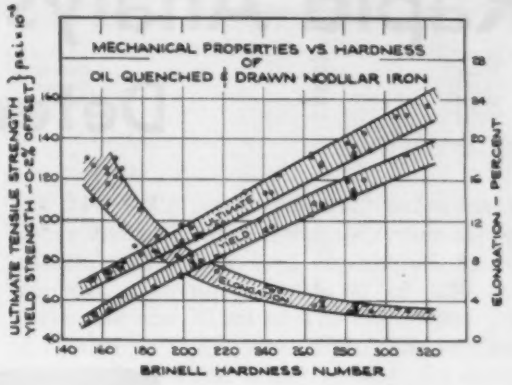
The use of higher manganese content than normal or small quantities of carbide stabilizer, such as chromium or molybdenum, are beneficial in nodular irons to be quenched and tempered. Secondary graphitization is retarded or suppressed and better control obtained over tempering. Work in progress indicates that appreciably higher

TABLE III

RANGE OF COMPOSITIONS IN FIG. 7

Total carbon, pct	2.90-3.50
Silicon, "	2.30-3.00
Manganese, "	0.30-0.50
Sulphur, "	0.01-0.02*
Phosphorus, "	0.02-0.05
Magnesium, "	0.04-0.10
Nickel, "	0.00-1.00
Copper, "	0.00-1.00

FIG. 7—Strength-hardness relationship in quenched and tempered nodular irons of various compositions (Table III).



elongation at a given yield strength or hardness results.

From a considerable amount of data, the types of structures having the poorest ratios between ultimate strength and yield strength and between strength and hardness are known. They are found in irons with a pearlitic matrix or with a pearlite-ferrite mixture.

For quenched and drawn or tempered nodular irons, the strength - hardness relationship has been found to be reasonably consistent. This was true for a large number of heats, with different compositions and alloy contents. In Fig. 7 is shown the relationship developed. The range of compositions included is given in Table III.

Published data[3] on mechanical properties of quenched and tempered black-heart malleable irons would appear to indicate lower strength and ductility at a given hardness than shown in Fig. 7. However, the phosphorus content of the malleable irons was considerably higher. Comparison of results at similar phosphorus levels will be necessary to clarify this relationship.

In Fig. 8 the approximate relationship of mechanical properties and hardness for nodular irons with ferritic and pearlitic microstructures is shown. Not only is the spread of properties broader at a given hardness, but the yield strength is consistently lower at a given hardness.

This article is from a paper given by Mr. Rehder at the International Foundry Congress, Sept. 10-14, Brussels, Belgium.

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[1] Greiner, Marsh, and Stoughton, "Alloys of Iron and Silicon," McGraw Hill Book Co., New York, 1933.

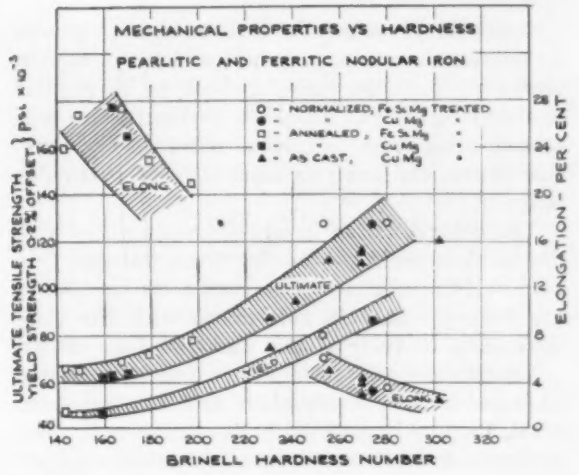
[2] Rehder, J. G., Transactions American Foundrymen's Society, Vol. 57, p. 549, 1949.

[3] Schneidewind and Reese, Transactions American Foundrymen's Society, Vol. 56, p. 410, 1948.

[4] Scapple, Iron and Steel, Vol. 23, Nos. 10, 11 and 12, p. 379, 1950.

[5] Rehder, J. E., American Foundrymen's Society Preprint No. 51-43, 1951.

FIG. 8—The strength-hardness relationship of annealed, air cooled or as-cast nodular irons. Not only is spread of properties broader at a given hardness, but yield strength is lower.


MECHANICAL PROPERTIES VS HARDNESS
PEARLITIC AND FERRITIC NODULAR IRON
O - NORMALIZED, Fe Si Mg TREATED
● - " Cu Mg "
□ - ANNEALED, Fe Si Mg "
■ - " Cu Mg "
▲ - AS CAST, Cu Mg "
ULTIMATE TENSILE STRENGTH
YIELD STRENGTH 0.2% OFFSET } psi x 10⁻³
ELONG.
ULTIMATE
YIELD
ELONG.
ELONGATION - PER CENT
BRINELL HARDNESS NUMBER

Rapid Analysis Determines CERIUM IN STEEL

By Charles Morris Johnson
Consultant
Crucible Steel Co.

A rapid method of determining the cerium group rare earth content in steels where they are used as additive agents has been developed. The method involves precipitation with dry sodium peroxide powder from the still acid sulfate solution. Lanthanum and neodymium are precipitated with cerium.

RECENT wider use of the cerium group rare earths as additive agents in alloy steels has given added importance to a rapid method of accurately determining the total content of these elements in the alloys.

Such a method was developed in 1941 by the Park Chemical Laboratory to determine the cerium content in a sample of 18 pct Cr, 8 pct Ni steel.

Today alloys containing cerium, lanthanum and neodymium, etc., are being added to molten austenitic stainless steels as well as to regular engineering alloys. Since the cerium group content in some steels is critical within a very narrow range, the analysis method is of particular interest.

The determination involves precipitation with dry sodium peroxide powder from the still free acid sulfate solution. The cerium group metals are coprecipitated in accordance with the close agreement of their atomic numbers (see table).

Lanthanum and neodymium are precipitated like cerium. Praseodymium has not yet been tried. Barium is detected by its tendency to form an insoluble white precipitate of barium sulphate when the steel is first dissolved. This must be filtered out and discarded at this step.

Cerium in 24 pct Cr and other steels can be detected by gravimetric analysis. Weigh 2 and 3 g of the sample into 600 ml beakers. Drillings are dissolved in 100 ml of 1:5 sulfuric acid, and boiled down to 70 ml. This is cooled and 5 level spoonsful (about 2.5 g per spoonful) of the dry cp sodium peroxide is added, stirring with each spoonful.

Action is vigorous with each addition. The solution will be still acid. Dilute with distilled water to 100 ml and boil down to 70 ml. Add 40 ml H_2O. Stir in a little low-ash filter paper pulp and filter the peroxidation precipitate onto double Whatman's No. 41—11 cm papers. Do not wash the precipitate.

Dissolve the precipitate off the papers with 30 ml of hot 1:7 H_2SO_4 added in 5 ml portions. Avoid excess acid. Drain and wash the papers 40 times with H_2O containing a few drops of the 1:7 acid per 100 ml.

Catch the solution and washings in 600 ml beakers and dilute to 300 ml. Add 50 ml of ammonium oxalate solution and then filtered NH_4OH until the test solution turns brown and slightly cloudy. Stir well, and add 1 g of ammonium oxalate to dissolve the brown cloud.

Let the white cerium oxalate settle overnight.

Then filter it onto double Whatman's No. 40-12½ cm papers. Wash 40 times with a solution of 50 ml of ammonium oxalate* and 1 g of oxalic acid in 500 ml of H_2O.

Burn off the washed papers with the cerium oxalate in weighed porcelain crucibles; cool and weigh the red CeO_2. Multiply the latter weight by 81.40 and divide by the weight taken to get percentage of cerium. The CeO_2 should be heated with 25 ml of 1:3 H_2SO_4 in a beaker to make sure there are no appreciable insolubles in it.

* Ammonium oxalate solution: 50 grams of oxalate dissolved in 1 liter of H_2O and filtered before using.

No attempt is made to distinguish cerium from the other elements of its group. This unwashed peroxidation precipitate can be dissolved with 1:1 hydrochloric acid instead of the 1:7 sulfuric acid. Wash the filter papers well with water containing a little HCl. Catch the solution and washings in 600 ml beakers. Dilute to 300 ml with H_2O. Add 50 ml of ammonium oxalate solution.*

Precipitate not washed

Add filtered 1:1 NH_2OH until the solution of the sample turns brown and a slight precipitate forms. Add 1 g of oxalic acid crystals. Stir well and finish the analysis as previously described. Credit is due Alphonse Suk for the modification in which the peroxidation precipitate is dissolved in HCl instead of H_2SO_4.

The dry-sodium peroxide precipitate is not washed because it is appreciably attacked by any wash that has been tried. The oxalate precipitation of Ce that follows, prevents interference from the small amounts of iron chromium, etc., in the unwashed precipitate.

Excess of sulfuric acid is avoided as it is suspected excessive amounts mean more ammonium sulfate. This may deter the cerium oxalate from forming. The following recovery figures are derived from the 1941 analyses:

ADDED	RECOVERED
19.88 mg of Ce	19.51 Mg of Ce
20.17 mg of Ce	19.18 Mg of Ce
10.0 mg of Ce	9.6 Mg of Ce

The above amounts of cerium percipitate promptly as oxalate; however, 2 mg or 3 mg form so slowly one might conclude the steel contained only traces, if any, of the cerium group. This can be overcome by adding 10 or 20 mg of the 97 pct Ce metal to the sample at the start of the analysis. This added cerium is carefully weighed in with 3 g of the test and continued as previously described. This added Ce promptly precipitates as oxalate and carries with it the remaining milligram or two of cerium.

Any excess of cerium found in a test, over the 10 or 20 mg added, is calculated as percent of cerium in the sample. Cerium oxide, CeO_2, can be made by igniting cerium oxalate crystals and can be used as a source of added cerium in the form of oxide instead of metal but is difficult to handle.

CERIUM GROUP CLOSELY RELATED

Metal	Atomic Numbers	Atomic Weights
Cerium	58	140.13
Lanthanum	57	138.92
Neodymium	60	144.27
Praseodymium	59	140.92
Barium	56	137.37

A 24 pct Cr steel containing percentages of copper and molybdenum dissolves very slowly in sulfuric acid. It is first decomposed by heating with a mixture of 15 ml of 1.20 sp gr nitric acid and 20 ml of 1:1 HCl. Then 20 ml of 1.82 sp gr H_2SO_4 are added. The solution is taken to first white fumes of SO_3. Do not prolong the fuming.

These sulfates are dissolved by heating in water, and taken to the appearance of white fumes of SO_3 again. They are redissolved in water, then boiled or evaporated to 70 ml. This removes all HCl and HNO_3 decomposition compounds. The analysis is then completed as previously.

RESULTS

Gravimetric Method	Volumetric Titration
0.25 pct Ce	0.18 pct Ce
0.21 pct Ce	0.21 pct Ce
0.22 pct Ce	
0.20 pct Ce	
0.25 pct Ce	
0.22 pct Ce	

When 1.5 mg of Ce (in the form of Ce-La-Nd alloy) was added to 3 g of 24 pct Cr steel, with 20 mg of Ce metal, an excess of 1.0 mg of Ce was recovered. When 2.5 mg of CeO_2 in the alloy was added to 3 g of 24 pct Cr steel with 20 mg of Ce, an excess of 2.0 mg was recovered. The 2 mg of Ce are equal to 0.066 pct Ce in 3 g of the test.

Remove excess ammonium oxalate

In the volumetric determination of cerium in steel by titration of cerium oxalate, the precipitate is washed 60 times with water containing 5 drops of 1:7 H_2SO_4 in 500 ml of water. This removed excess ammonium oxalate used in the precipitation.

The cerium oxalate is dissolved off the filters with 50 ml of hot 1:7 H_2SO_4. The filter paper is washed 60 times with H_2O adding the sulfuric acid in portions between washings. Solutions and washings are titrated to a permanent pink with N/100 $KMnO_4$ (0.3167 mg $KMnO_4$ in one liter of H_2O) in a volume of about 150 ml. Before titrating, warm the solution to about 80°F. The oxalic combines slowly with the $KMnO_4$ at first. Stir well and note if fading still shows. The true end point is quite permanent.

Results of the tests indicated 33.5 mg of 100 pct Ce took 68 ml of N/100 $KMnO_4$, or, 1 ml of the $KMnO_4$ solution yield 0.00049 g of cerium. Further, 55.2 mg of 100 pct Ce required 119 ml of N/100 $KMnO_4$, indicating 1 ml of solution

Cerium analysis (continued)

yielded 0.00046 g of cerium. The working factor should be obtained in actual analysis by putting known amounts of cerium through the entire method.

The cerium-lanthanum-neodymium alloy may be tested by this method. Analysis provided by the seller for samples of the alloy indicated the following chemical content: Ce, 41 to 46 pct; La, 30 to 32 pct; Nd, 24 pct; Fe, 1 pct.

A sample block of the alloy was tested. Fresh drillings were used as the latter soon get coated with white cerium oxide.

These drillings flash violently if only a few particles are dropped into 60 pct perchloric acid. Likewise, concentrated HNO_3 acid may be explosive with cerium drillings. Different amounts of these fresh drillings were weighed in with 3 g of 24 pct Cr steel. They dissolved readily in 100 ml of 1:5 H_2SO_4 along with the steel.

ALLOY YIELD RESULTS

Qty of alloy	Ce group yield
51.5 mg	47.7 mg
101.2 mg	98.5 mg
50.2 mg	49.2 mg
102.0 mg	98.5 mg

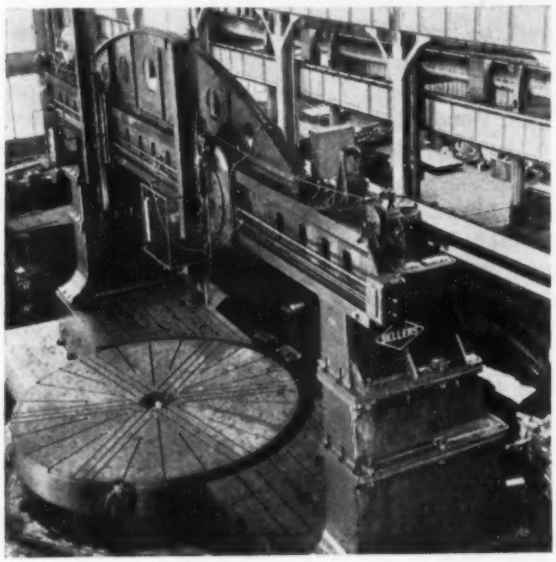
Results show the elements contained in the alloy are precipitated almost completely by the sodium peroxide and yet the solution is still acid after the precipitation is finished. This is to be expected as the cerium group elements are very close to each other in their atomic numbers. They all obtain oxygen from the molten steel. The essential factor is not how much of each of these elements is in the alloy but what the total content of all may be. The method gives this information.

New boring mill will take 350-ton load

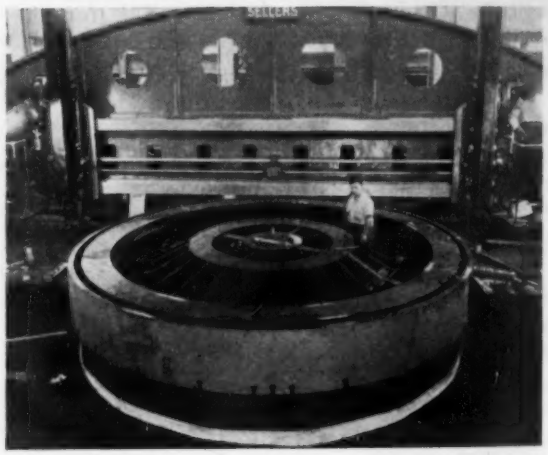
One of the largest boring mills ever built is now being shipped to the Schenectady Works of General Electric Co. The 42-ft machine has been designed especially for handling large diameters and high tonnages.

The distance between uprights is 42 ft 2 in. The table is 20 ft in diam. Maximum work load on the table is 82 tons. The whole machine weighs 350 tons. The table drive motor is 100 hp. The table runs on oil-flooded tracks of Formica, made especially for this purpose. The table runs true within 0.001 in.

Unlike most boring mills, there is no provision for power raising or lowering of the cross rail.



HUGE 40-FT Sellers boring mill erected for test in builder's shop prior to shipment to General Electric.

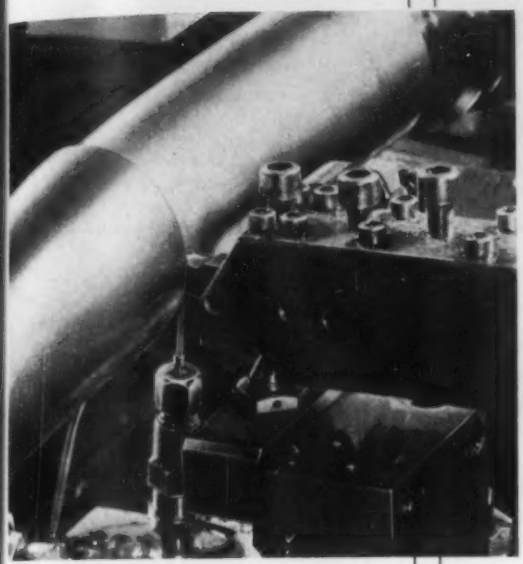


SETUP by which the huge boring mill itself was used to machine its own table. White strip at bottom, a chip shield, marks the temporary table used. Column sections have been removed to bring the cross rail down.

Instead, the columns are sectional. When setting up the machine for a workpiece of given height, the entire rail assembly is lifted off by cranes and column sections removed or inserted. Then the rail is lowered back into place and fastened down. Maximum height under the cross-rail, when all column sections are in use, is 14½ ft. Similar columns are used on two other large boring mills recently installed.

The huge machine was used to machine its own table in the plant of the Consolidated Machine Tool Corp., designers and builders of the machine. A temporary dummy table was set and the permanent table was mounted on this for machining.

JET SPRAYED OIL UPS TOOL LIFE 1200 PCT



COOLANT is supplied for turning operation from below via small high-pressure jets in Gulf Hi-Jet system.

This method combines a new cooling and lubricating oil with a new way of applying it in machining operations. Oil is sprayed from below the tool in small high-pressure jets. Cooling and lubricating are much improved. Tool life with high speed steel tools is 6 to 12 times better, 3 to 5 times better with carbides. Surface finish is improved, tool buildup and nose-radius wear decreased.

A new development in the use of oil for lubrication and cooling of machining operations has been shown to increase tool life as much as 1200 pct. Increases in tool life up to 500 pct have been found in tests with carbide tools, and up to 1200 pct with high speed steel tools.

The development consists of a new oil and a new method of applying the oil during machining, and was made in the research laboratories of Gulf Oil Corp. The Hi-Jet method consists of directing small high-speed jets of oil from below the cutting tool. The streams of oil pass through the space between the work and the side relief face of the tool. They are aimed at the line of contact between the work and the cutting edge.

Tests indicate that much of the oil actually passes through between the tool edge and the work, probably as a vapor. It condenses again on the chip and tool shank, so it provides both a cooling and a lubricating action. Tests have shown that chips leaving the contact area are coated with oil, tool buildup is reduced or eliminated, nose wear is reduced, and the chip crater is more uniform.

The majority of tests made during the past year with Hi-Jet have been on SAE 1020, 3140, and 3150, using high speed steel tools. The average results of these tests are shown in the accompanying table. In addition, tests were run on titanium, Inconel M, AISI 8742 and 416. and other materials, using both high speed steel and carbide tools. In all tests tool life was increased 3 to 5 times with carbides and 6 to 12 times with high speed steel tools.

The equipment consists of a 400-psi motor driven pump, filter, pressure-regulating valve, jet nozzle or nozzles, nozzle holders, and if desired, a special low-pressure coolant spray. The suction side of the system is connected to the existing coolant system on a machine. The dis-

FLOOD COOLING v. HI-JET

Steel	Cutting Conditions	Tool		Tool Life			
				Overhead Flood		Hi-Jet	
		Material	Shape	Oil	Min		Min
SAE 3150	110 sfpm 0.011 in. feed 0.150 in. depth of cut	18-4-1 High-Speed Steel	10-12-8-10-6-6-3/64	A B	10.02 12.60	Gulf Hi-Jet Oil	177
AISI 3110	140 sfpm 0.011 in. feed 0.150 in. depth of cut	18-4-1 High-Speed Steel	10-12-8-10-6-6-3/64	B C D A	9.3 21.0 16.0 23.0	Gulf Hi-Jet Oil	339.5
SAE 1020	212 sfpm 0.033 in. feed 0.125 in. depth of cut	18-4-1 High-Speed Steel	0-8-8-8-8 5-1/32	E	1.27	Gulf Hi-Jet Oil	19.5
AISI 416 Stainless	160 sfpm 0.011 in. feed 0.150 in. depth of cut	18-4-1 High-Speed Steel	10-12-8-10-6-6-3/64	F	9.4	Gulf Hi-Jet Oil	183.4

New coolant development (continued)

charge end is connected by flexible hose to the nozzle or nozzles.

Hi-Jet will be manufactured under license from Gulf by Thomson Products, Inc. Initial units will be supplied with all equipment necessary for installation on most types of engine and turret lathes.

At first the method is expected to find widest use on turning operations because that is where it is easiest to apply. Suitable nozzle designs, valves, and holding fixtures are being designed for use in other machining operations such as milling, gear cutting, broaching, and certain types of drilling and grinding.

During development work on the Hi-Jet method, it became evident that the nature of the oil used had a great bearing on the effectiveness of the system. With some oils it was found the results were only slightly better than with the overhead flood method of supplying coolant. More than 50 types of oils and additives were tested in work which lead to development of a special Gulf oil especially for use with Hi-Jet equipment.

Since Hi-Jet oil gets to the exact point of contact in machining, where temperatures are highest, considerable smoke is generated. For this reason various types of smoke quenching attachments have been developed. One of these is a series of shower heads placed above and below the cutting surface. It will utilize the available flood equipment for coolant, providing a curtain of liquid to quench smoke.

All Gulf tests were performed on the same standard turret lathe. Test specimens for each

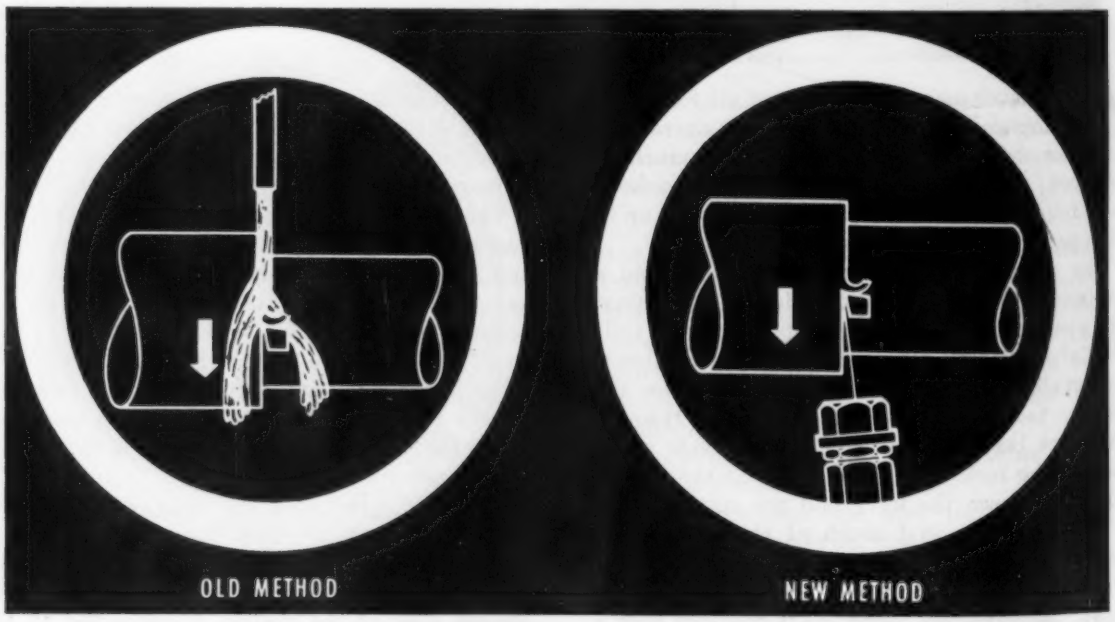
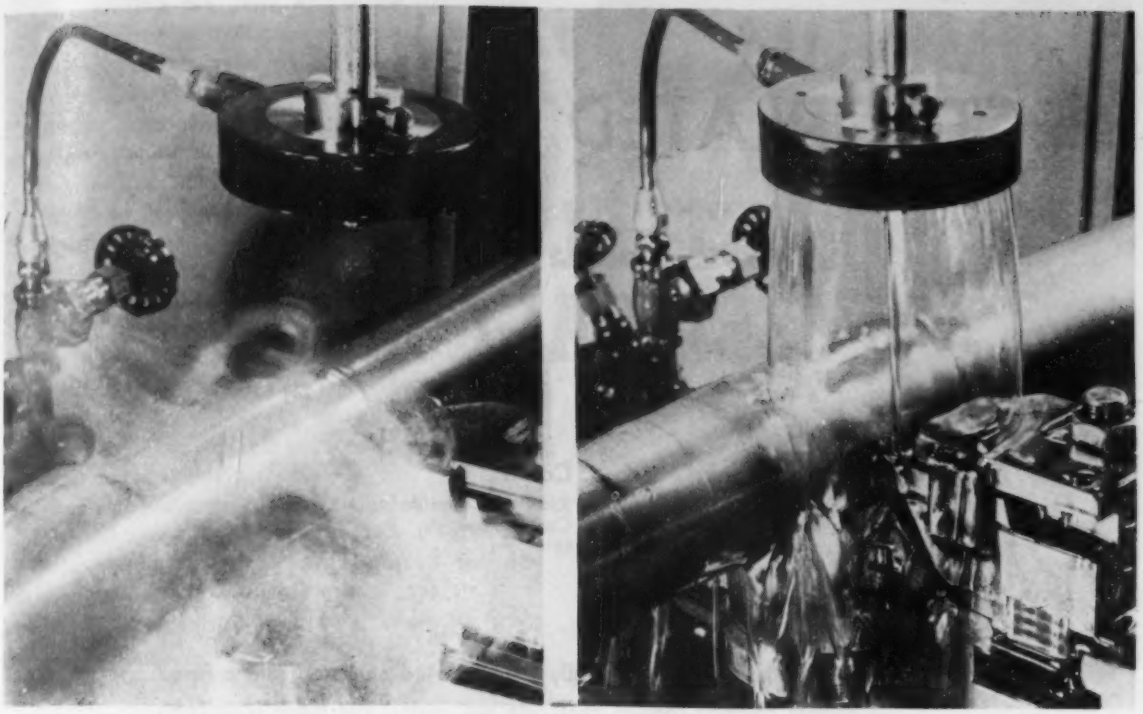
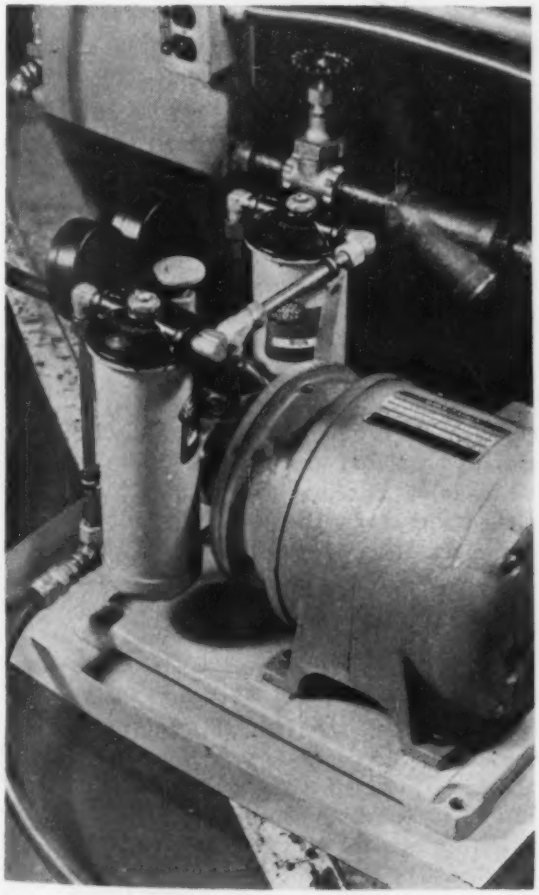


DIAGRAM shows difference between conventional flood method of supplying coolant, left, and Hi-Jet method.



TURNING using new method of suppying coolant produces much smoke and vapor, left, indicating coolant is reaching cutting edge. Shower of oil right, quenches smoke.



PUMP, filter, and regulating equipment connect to the machine's standard coolant system, and supply high-pressure oil to jet nozzles below the tools.

type of steel came from the same heat, and were carefully heat treated to maintain the highest possible degree of uniformity in machinability. Tools were ground in jigs to a standard finish. Tool dimensions were those recommended by the ASTE Handbook for the type of steel being tested. The standard coolants used in comparison tests were those recommended for the given operation, tool material, and workpiece material.

Jet spray improves finish

Test results indicated several comparisons with standard flood cooling and lubricating methods. The use of a jet small enough to enter the gap between the heel of the tool and the work greatly improved penetration at any jet speed. There is no disturbance by cross flow from splash on the tool.

Cooling is greatly improved, since contact with the tool is direct, the flow velocities are far higher, and liquid is applied in a thin sheet. Two to three times the cooling is obtained with 1/20 the oil circulation. The liquid is passing the edge of the tool, through passages caused by the difference in roughness between the cut face and the tool edge, as a vapor. It then condenses on the chip and the tool shank.

Surface finish is in most cases greatly improved. Test results have shown a reduction in surface roughness from 200 to 60 microinches rms. The effects of tool buildup and radius wear are practically eliminated. There is less tendency toward work-hardening of the machined parts.

ALUMINUM ELECTROPLATED ON STEEL FROM FUSED SALT BATH

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Aluminum has been successfully electroplated on steel from a fused aluminum chloride-sodium choloride salt bath. The plate is uniform and no interfacial layer of iron aluminum alloy occurs. Aluminum coated steels show high resistance to rusting in industrial, sea-coast and humid atmospheres. Coating is free of continuous pores.

As the supply of steel and protective coating metals becomes restricted, there is an increasing interest in developing aluminum coatings to protect steel against rusting and scaling. Aluminum coated steels might replace in part, not only the galvanized and tinned products, but also the highly alloyed corrosion resistant and heat resistant steels.

A suitable carbon content in the steel would give the strength requirements while the aluminum coating would provide protection against corrosion and scaling. High resistance to rusting in industrial, sea-coast and humid atmospheres has been shown by aluminum-coated steels. The behavior in industrial atmospheres was superior to galvanized coatings of a similar thickness.

The most common method of applying aluminum coatings to steel products is by hot dipping, which unfortunately is associated with the formation of a brittle aluminum-iron alloy interfacial layer which limits forming operations. This has been overcome by developing at Alcoa's Aluminum Research Laboratories the details necessary to form electroplated coatings of aluminum on steel.

Investigators recognized long ago it would be impossible to electroplate aluminum from an aqueous solution and turned their attention to molten salt baths. The earliest reference is a British patent granted to T. Bell in 18C1.

Among the many bath combinations studied, the principal constituent was anhydrous aluminum chloride. Deposits of aluminum were obtained, but always in the form of loose spongy masses. Numerous patents covering densifying agents, rotating electrodes, and compacting devices have been issued.

It was found that satisfactory aluminum plating could be obtained with an 80 pct aluminum chloride, 20 pct sodium chloride bath operating at a temperature of approximately 350°F with a current density of 15 amps per ft^2. A smooth, matte-type finish was produced.

Aluminum plating can be carried out satisfactorily in an ordinary pyrex beaker, if the articles to be plated are small. Larger tanks may be made of 2S aluminum. Aluminum tanks are etched slightly by the bath, but the rate of corrosion is slow. The large cell used in these studies is shown in Fig. 1.

When melting down the bath, the aluminum chloride should be placed beneath the sodium chloride to protect it from water vapor in the air. Flux grades of aluminum chloride and sodium chloride may be used. Anodes of 2S aluminum may be used. The steel parts to be plated should be cleaned, using a hydrochloric acid solution, rinsed, and wiped dry.

Before actual plating is started, a test sample should be run. This test run removes impurities and water from the bath. Since anhydrous aluminum chloride is extremely hygroscopic, it inevitably contains some water and small

amounts of zinc, tin, lead, and other impurities.

When current is first passed through the cell, the water will be removed by electrolysis, and continued passage of current will remove metallic impurities, since they will be plated out in preference to aluminum.

The specimen should be run at a current density of 25 to 30 amps per ft^2 for approximately 30 minutes. If at the end of this time good plating is not obtained on a second specimen, the purifying process must be continued.

Current densities ranging from 5 to 25 amps per ft^2 may be used, but the optimum value is approximately 15 amps per ft^2. Lower current densities produce smoother deposits but adherence may be poor. High current densities produce dendritic deposits.

Voltage required will depend on the geometry of the cell, averaging approximately 0.5 per in. of anode-cathode spacing at 15 amps per ft^2 current density. If a flash surface of aluminum is desired, much higher current densities may be used.

Agitation may be used to permit an increase in current density. Agitation of the work itself is preferable to agitation of the bath, since in time an aluminum oxide sludge accumulates at the bottom of the container. Current densities as high as 150 amps per ft^2 have been employed, using agitation.

Throwing power of the aluminum plating bath is poor. Recesses in articles such as castings receive little or no coating. It is, however, possible to plate these areas by using auxiliary anodes inside or near the recesses.

FIG. 1—Aluminum chloride-sodium choloride is used in large cell to successfully electroplate aluminum on steel.

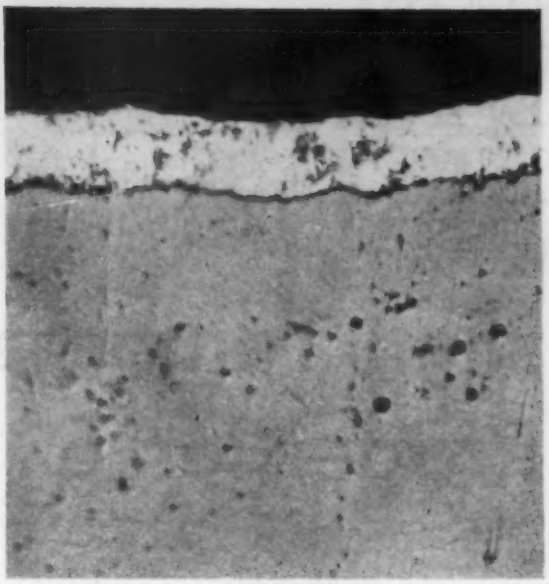

FIG. 2—Photomicrograph of aluminum-steel interface shows uniform coating free of continuous pores. 500X.

Aluminum chloride must be added frequently to replace losses from the bath by fuming and hydrolysis. Fuming is rather severe when the cover is lifted, and adequate ventilation is required. The amount of fuming, and consequently the amount of make-up aluminum chloride which must be added, depends upon the bath temperature (fuming is more severe at elevated temperature) and the relative humidity of the atmosphere.

A cell similar to the one shown in the photograph was operated for several months, with no serious difficulties. Aluminum chloride fumes were collected by passing them through a Rotoclone air washer. Since the fumes generate a weak hydrochloric acid solution in the water of the Rotoclone, the concentration of acid was kept low by providing more water than usual.

Apparent resistivity of the bath increases as aluminum chloride is depleted. Once a voltage-current relationship for any given set of conditions with the original bath composition has been found, it should be maintained by periodic addition of aluminum chloride.

Deposition of aluminum from an aluminum chloride-sodium chloride bath will proceed at about 0.3 gms. per amp hr or 0.0004 in. thickness in 30 minutes at 18 amps per ft^2. A current efficiency of about 80 pct is obtained. If agitation is employed, a like amount of metal can be deposited in 5 minutes, but current efficiency will be somewhat lower.

A photomicrograph of the aluminum-steel interface is shown in Fig. 2. The coating is uniform and contains no continuous pores. There is no interfacial layer of iron aluminum alloy such as occurs on hot-dip coated articles.

RARE EARTHS INCREASE

High Temperature Properties of Magnesium

By K. Grube
Engineer
Battelle Memorial Institute
Columbus, Ohio

Additions of Misch metal up to 2 pct increase the creep resistance of magnesium extrusion alloys. Nickel and manganese also improve the high temperature properties at 600°F. A fluosilicic-acid treatment gives these magnesium alloys good protection against oxidation up to 700°F. Tests used 3 in. billets extruded to ¾ in.

UNTIL the second World War, little attention was paid to the use of the rare-earth elements as alloying components in magnesium. However, examination of captured aircraft revealed that German metallurgists employed cast and wrought magnesium-cerium-manganese alloys in aircraft engine parts. These parts were exposed to operating temperatures of 300°F and higher. The cast alloys usually contained from 2 to 6 pct rare earths and 1½ to 2 pct Mn. These magnesium alloys were of the type usually identified as EM22, EM42, or EM62. The first digit indicates the rare-earth content, while the second indicates the maximum manganese content. The wrought alloys generally contained the lower percentages of rare earths.

In 1949, the National Advisory Committee for Aeronautics sponsored a study of the magnesium-rare-earth wrought alloys at Battelle Memorial Institute. The objective of the investigation was: to establish the optimum rare-earth and manganese contents of magnesium alloys for the best elevated-temperature properties; to learn the effects of minor additions of other elements on these properties; to correlate the structure and alloy composition with the creep properties.

Several investigators[1, 2, 3, 4] have shown that the tensile properties of magnesium alloys at elevated temperatures varied directly with the cerium content. There were indications that manganese was a desirable addition to the cerium-bearing alloys when maximum creep resistance was required. The cerium was added to the magnesium alloys in the form of Misch metal. This consists of approximately 50 pct Ce, 25 pct La, and the balance other rare earths with, perhaps, 1.0 pct Fe and other impurities.

In the present research, alloy billets 3 in. in diam. were extruded to ¾-in. diam. bar stock from which tensile and creep specimens were prepared. The beneficial effects of the Misch metal additions on the tensile properties of a manganese-magnesium-base alloy are indicated in Table 1. These data show that the ultimate strength at room temperature increases with rare-earth additions of up to about 1 pct. Above this level the strength remains at about 35,000 psi. The greatest effect of the Misch metal content is apparent in tensile tests run at 600°F where the ultimate strength increases from about 4000 psi at zero pct Misch metal to about 10,200 psi at 2 pct. Additions of more than 2 pct Misch

TABLE I

EFFECT OF MISCH METAL ON PROPERTIES OF EXTRUDED MAGNESIUM-MANGANESE ALLOYS.

Alloy Number	Misch Metal, pct	Mn, pct	Room Temperature(1)			600°F.(2)				
			Yield Strength at 2 pct Offset, psi	Ultimate Tensile Strength, psi	Elong. in 2 In., pct	Yield Strength at 2 pct Offset, psi	Ultimate Tensile Strength, psi	Elong. in 2 In., pct	Minimum Creep Rate, pct/Hr.(3)	Total Deformation After 120 Hrs., pct
A4983	0.0	1.80	27,000	30,450		3,400	4,400	80.0	0.0046	0.680
A5109	0.41	1.65	23,900	31,000	3.0	6,075	9,200	46.0	0.0020	0.301
A5259	0.73	1.86	26,625	32,100	3.5	6,275	8,750	79.2	0.0022	0.230
A5110	1.34	1.56	29,900	35,375	5.5	7,275	10,650	86.0	0.0014	0.303
A4975	2.41	1.90	27,250	33,000	7.2	7,400	9,950	116.0	0.0008	0.294
A4974	4.31	1.77	31,900	36,150	4.0	7,725	10,500	91.7	0.0034	0.520
A4973	6.01	1.81	27,500	37,500	2.8	7,750	10,850	122.5	0.0020	0.504

(1) HTA—Solution heat treated 24 hr. at 1040°F., air cooled, and aged at 400°F. for 16 hr.
(2) HTAS—Stabilized 24 hr. at 650°F. after the HTA treatment.
(3) Stress, 2000 psi.

metal are relatively ineffective in imparting further improvements in strength.

Misch metal does not have a very marked effect on the creep resistance of the magnesium-manganese alloys at 600°F. There is some evidence that the best creep resistance is obtained when the Misch metal content is in the range of 1.4 to 2.4 pct. It was found that creep data for the magnesium-manganese-cerium alloys were rather inconsistent. The inconsistency increased with Misch metal content.

As shown by the data in Table II, the addition of manganese to the magnesium-misch metal alloys improves the creep resistance at elevated temperatures. The 2 pct Misch metal alloy, without manganese, elongates 0.5 pct under a load of 2000 psi at 600°F in approximately 5 hr. When 1.90 pct Mn is added to the alloy, the same load can be supported for approximately 335 hr at the same temperature with only 0.5 pct elongation. The creep resistance of alloys containing manganese is reduced when the Misch metal content

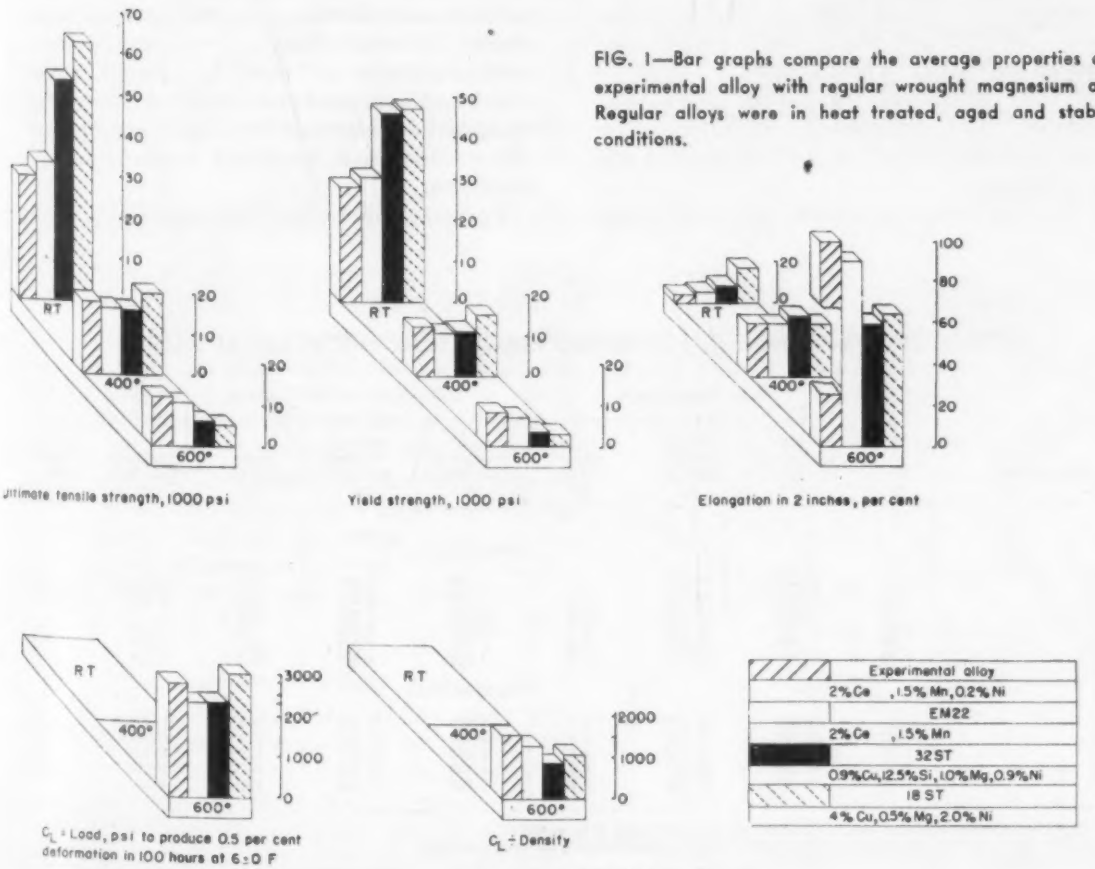
RT
400°
600°
Ultimate tensile strength, 1000 psi
Yield strength, 1000 psi
Elongation in 2 inches, per cent
C_L = Load, psi to produce 0.5 per cent deformation in 100 hours at 600 F
C_L ÷ Density
Experimental alloy
2% Ce, 1.5% Mn, 0.2% Ni
EM22
2% Ce, 1.5% Mn
32 ST
0.9% Cu, 2.5% Si, 1.0% Mg, 0.9% Ni
18 ST
4% Cu, 0.5% Mg, 2.0% Ni

FIG. 1—Bar graphs compare the average properties of an experimental alloy with regular wrought magnesium alloys. Regular alloys were in heat treated, aged and stabilized conditions.

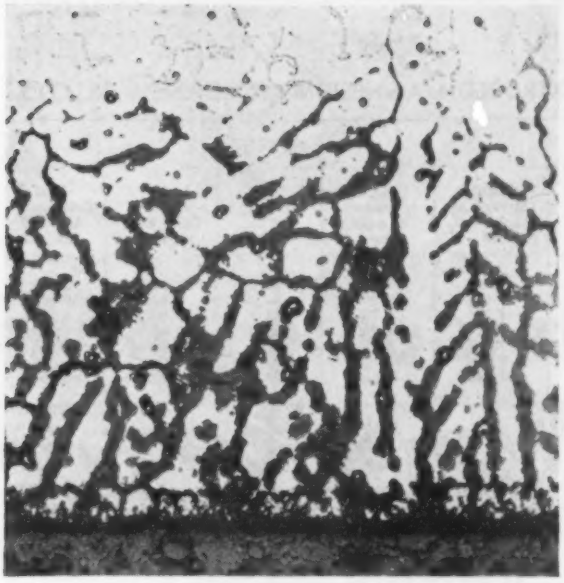

FIG. 2—Section of uncoated EM62 cast alloy after exposure of 900 hrs at 700°F. 100X.

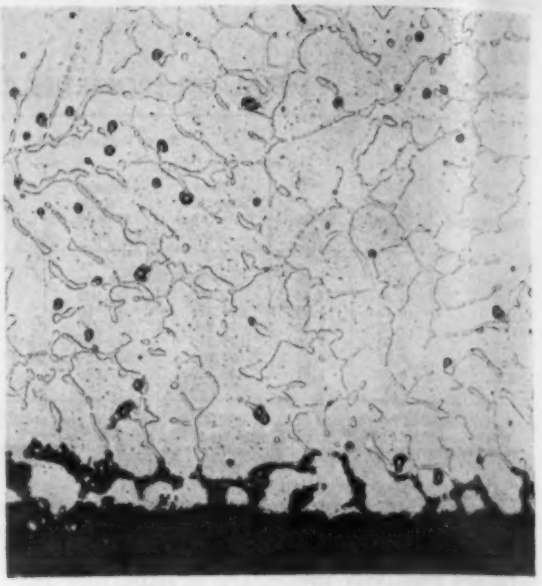

FIG. 3—Same as Fig. 2 except fluosilicic-acid protective coating was 100X.

Rare earth, magnesium alloys (continued)

is increased from 2 to 4 pct. Manganese has only a slight beneficial effect upon the tensile properties at room temperature and at 600°F.

The mechanical properties of the magnesium rare-earth alloys are influenced considerably by heat treatment. Leontis,[5] investigating the effects of the individual rare-earth elements without cerium on the properties of extruded magnesium alloys, found that each type of alloy responded differently to heat treatment. All alloys except the magnesium-lanthanum alloys were hardenable. The magnesium-didymium alloys had the highest strength in the heat-treated and aged conditions.

In the work for NACA, a study was made to determine the effects of heat treatment on the properties of EM42 and EM62 alloys. The results showed that the best elevated-temperature properties were obtained by a solution heat treatment, followed by aging and stabilizing treatments. This heat treatment was employed throughout the experimental alloy evaluation program. Aging, followed by stabilizing, without prior solution heat treatment, produced the lowest yield and ultimate strengths at room temperature. Although data are somewhat limited, creep resistance is lowest in wrought material which had been aged and stabilized. It was higher in material which had been aged and highest in alloys which had been heat treated, aged, and stabilized.

Furnace-cooling the manganese-Misch metal

TABLE II

EFFECT OF MANGANESE ON EXTRUDED MAGNESIUM-MISCH METAL ALLOYS.

Alloy Number	Mn, pct	Room Temperature(1)			600°F.(2)				
		Yield Strength at 2 pct Offset, psi	Ultimate Tensile Strength, psi	Elong. in 2 In., pct	Yield Strength at 2 pct Offset, psi	Ultimate Tensile Strength, psi	Elong. in 2 In., pct	Minimum Creep Rate, pct/Hr.(3)	Total Deformation After 120 Hrs., pct
					2 Pct Misch Metal				
A5107	0.0	17,575	28,500		4,300	7,275	87	Very high	Failed
A4970	0.81	26,650	32,750	7.4	6,100	9,475	115	0.002	0.27
A5270	0.89	20,625	29,625	14.8	5,900	8,550	128		
A4971	1.24	28,400	33,250	5.5	7,200	9,850	95	0.002	0.39
A4972	1.55	25,350	31,450	5.5	7,150	9,325	81	0.001	0.30
A4975	1.90	27,250	33,000	7.2	7,400	9,950	116	0.001	0.29
					4 Pct Misch Metal				
A4847	0.0	29,100	32,350	5.7	4,925	10,125	129	Very high	Failed
A4846	0.62	26,175	30,850	6.5	6,150	10,400	126	0.030	4.7
A4845	1.03	25,250	30,700	5.5	6,575	10,675	125	0.023	4.4
A4844	1.38	24,850	30,250	3.5	6,700	10,800	129	0.016	5.0
A4843	1.66	27,450	32,000	5.2	7,025	11,300	100	0.01	1.3

(1) HTA—Solution heat treated at 1040°F. for 24 hr., air cooled, and aged 16 hr. at 400°F.
(2) HTAS—Same as HTA, but stabilized 24 hr. at 650°F. and air cooled following the aging treatment.
(3) Stress, 2000 psi.

alloys from the solution-heat-treating temperature was harmful to creep resistance at 600°F. Although the data are inconclusive, there was evidence that rapid cooling, as by a water quench, may have been slightly beneficial.

The effects of additional elements on the properties of EM62 and EM22 were investigated. It was found that the tensile properties of the EM62 composition at 600°F can be improved slightly by the following single-element additions: silver, barium, cadmium, nickel, sodium, strontium, or zirconium. Of these, nickel was most beneficial. In tests at 600°F under stresses of 1300 and 2000 psi, aluminum additions appeared to improve the creep resistance of the EM62 extruded alloy.

Because nickel apparently improved the strength values at the elevated temperature, considerable emphasis was placed on the study of this element in the EM22 base alloy. Small additions of nickel were found to reduce the creep resistance. However, they provided consistently good ultimate strength properties to the alloy at 600°F. The addition of small quantities of aluminum, silver, cadmium, cobalt, molybdenum, strontium, tellurium, or tungsten to the nickel-containing EM22-base alloy did not improve the creep properties, at least for test conditions of 600°F and 2000 psi stress.

In Figure 1, the properties of the experimental alloy containing 2 pct Ce and 1.5 pct Mn with either zero pct or 0.20 pct Ni are compared with properties of two commercial aluminum-base alloys. At room temperature, the aluminum-base alloys have better strength values than the modified EM22 alloy. However, as the temperature increases up to 600°F, the strength of the aluminum-base alloys decreases rapidly.

Limited efforts were made to correlate the metallographic structure of several of the extruded magnesium-manganese-cerium alloys with their creep properties. The results of this work were inconclusive, but it is believed that the study should be continued.

Examination of extruded and cast material of the EM62 composition revealed that oxidation of the cerium-rich phase occurred during prolonged exposures at 600 and 700°F. Some effort was made to find protective coatings which would prevent this oxidation. In this regard, a fluosilicic-acid treatment was successful in preventing excessive oxidation in samples heated at 700°F for 900 hr. The treatment is outlined in Table III. Photomicrographs of cast specimens after exposure at 700°F for approximately 900 hr are shown in Figs 2 and 3. They illustrate the effectiveness of the protective coating.

TABLE III

PROTECTIVE COATING TREATMENT

First Step: Degrease in a bath of:

Trisodium phosphate—240 grams
Sodium carbonate—240 grams
Distilled water—8.0 liters

Maintain bath temperature at 180 to 240°F. Immerse the specimen for 5 to 15 min. Use a current density of 15 amps./sq.ft. After degreasing, rinse the specimen in cold water.

Second Step: Dip specimen in a fluosilicic-acid bath of:

Hydrofluosilicic acid (H_2SiF_6)—250 ml.
Distilled water 750 ml.
Enough titanium potassium oxalate to saturate the solution.

Use bath at room temperature, immerse sample for 10 min. After this treatment, rinse specimens in cold water, then in hot water, and finally dry in an air blast.

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[3] Grube, K., and L. W. Eastwood: "Magnesium-Cerium Cast Alloys For Elevated-Temperature Service"; Proceedings, Am. Soc. Testing Materials, Vol. 50 (1950).

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[5] Leontis, T. E.: "Effect of Rare-Earth Metals on the Properties of Extruded Magnesium"; Am. Inst. Mining & Metallurgical Engrs., Preprint, 1951.

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"ALCOA, An American Enterprise," by Charles C. Carr. Charles Martin Hall's discovery of a cheap method of turning bauxite into aluminum by electrolysis turned into one of American industry's most fascinating stories. Here, told in warm, readable manner, is the story of the struggling young inventor and the growth of a great organization. Mr. Carr, now retired, is a newspaperman who became director of public relations for Alcoa. His position gave him access to a reservoir of information available to few others. Rinehart & Co., 232 Madison Ave., New York 16, N. Y. $3.50. 292-p.

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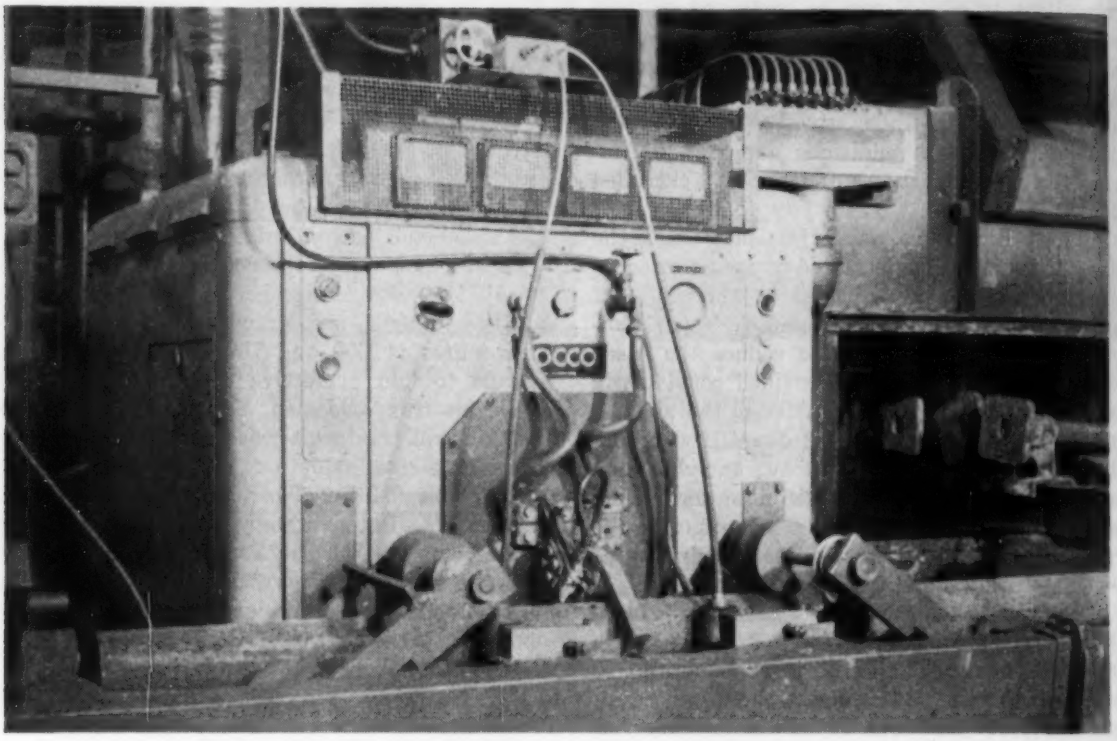
Induction Heat Cuts Descaling Costs



BARS MOVE automatically from furnace to inductor where heat rapidly expands scale which breaks off bar. Scale collects around left side of inductor, falls to receptacle. Water spray after quench aids operation.

Removal of scale on round bar stock by induction heat has been successfully tried at the Farmall Works of International Harvester. The method is practical and, by eliminating handling and equipment maintenance, offers a low-cost descaling method.

Induction heat raises the temperature of the surface scale rapidly enough to cause it to separate from the cooler base metal. This, with the progressive heating and irregular electrical characteristics, breaks the scale into small pieces as it separates from the base metal.

Tests were run on heat treated bar stock of 2¾ in. and 3⅛ in. diam x 39 in. long. It was found scale could be removed by passing the bars through an inductor ½ in. in width, connected to a source of 9600 cycle current. A power input of 15 to 25 kw per sq in. of surface area gave best results. The speed of travel was set to obtain a surface temperature of approximately 350°F at the inductor.

Bars are pushed automatically out of the furnace on carriers and dumped on a platform feeding a conveyer which moves the bars to the side of the furnace and onto "live rollers." These rollers move the bars at a fixed speed through the inductor. The bars pass onto the loading position where mechanical arms raise the bars from the live rollers and roll them over to a skid.

Magnetic attraction of scale particles to the inductor forms a ring around the side of the inductor where the work leaves. The ring builds up to about ¾ in. in depth then flows to a container below the inductor.

To utilize greatest clearance between inductor and bar, insulation was used only at the junction of leads and the single turn coil. High temperature refractory cement applied wet proved satisfactory. The scale does not short or arc on any other part of the inductor.

Moisture is a factor in removing scale by induction heat. Bars are water spray quenched following the tempering heat. This operation precedes descaling by about 15 minutes. Descaling is more complete and the scale tends to come off more easily than from bars that are dry.

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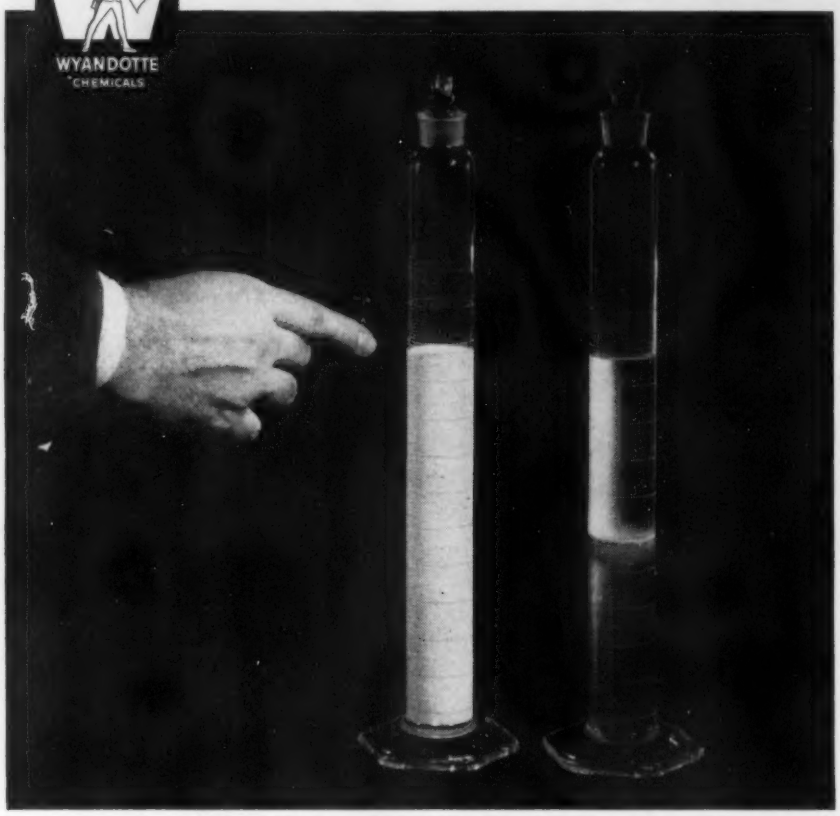

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Complete data and specifications of Morflex radial driveshafts with spline-jointed and one-piece tubular shafts are described in a bulletin. A working table of maximum recommended lengths and speeds is included. *Morse Chain Co.*

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Modern cold thread rolling machines designed to meet exacting demands of high production and thread accuracy are described in a recent 12-p. bulletin. The machines are designed with central lubrication and individual push button controlled drive. *Gebr. Hilgeland, Wuppertal-Ronsdorf, Germany.*

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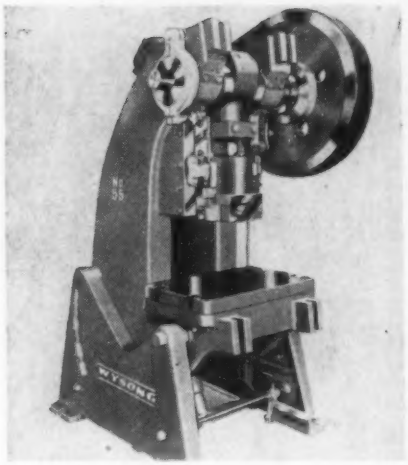

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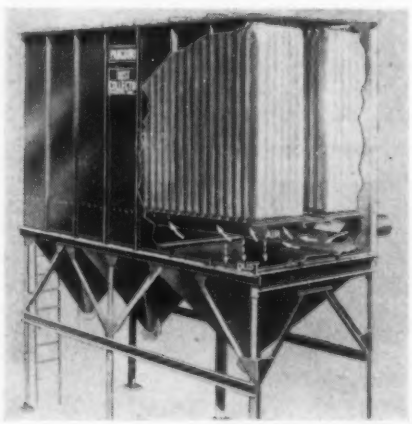
The square pin type clutch with three points of engagement and built-in non-repeat unit is used on a new 55-ton open back, inclinable punch press. Hardened tool steel wear plates for the clutch pin are replaceable without removing the fly wheel. Cam operation and spring loading of the clutch finger assures complete disengagement of the clutch providing exceptional safety for the operator. Die space is 12 in., measurement from bed to slide taken with stroke down and adjustment up. Construction is from hi-tensile castings made in the Wysong foundry. All parts are accurately machined and fitted with jigs and fixtures. Crankshaft is alloy steel forging, mounted in bronze lined bearings. Brake is split type with spring tensioner. Slide is hand scraped to insure accurate bearing and is adjustable with ball and socket screw. Knock out bars are furnished for slide. V-belt drive is standard. *Wysong & Miles Co.*

For more data insert No. 25 on postcard, p. 113

Hand lift truck handles pallets and skids

Dual-purpose superstructure on the new hand lift pallet trucks will enable them to handle 7 and 12-in. skids as well as single or double faced pallets. When the superstructure is in a raised position, it is clamped vertically to provide a backrest for the pallet load on the truck. When lowered, it is adjustable to 7 or 12 in. skid heights by a simple cam and slot arrangement. The truck is available in mechanical or hydraulic lifts. Platform trucks can be similarly equipped so that they handle several sizes of skids. This truck will find application in plants where there is not sufficient volume of either skids or pallets to keep specialized trucks for each busy or where flexibility is desired because of varying loads. *Yale & Towne Mfg. Co.*

For more data insert No. 26 on postcard, p. 113

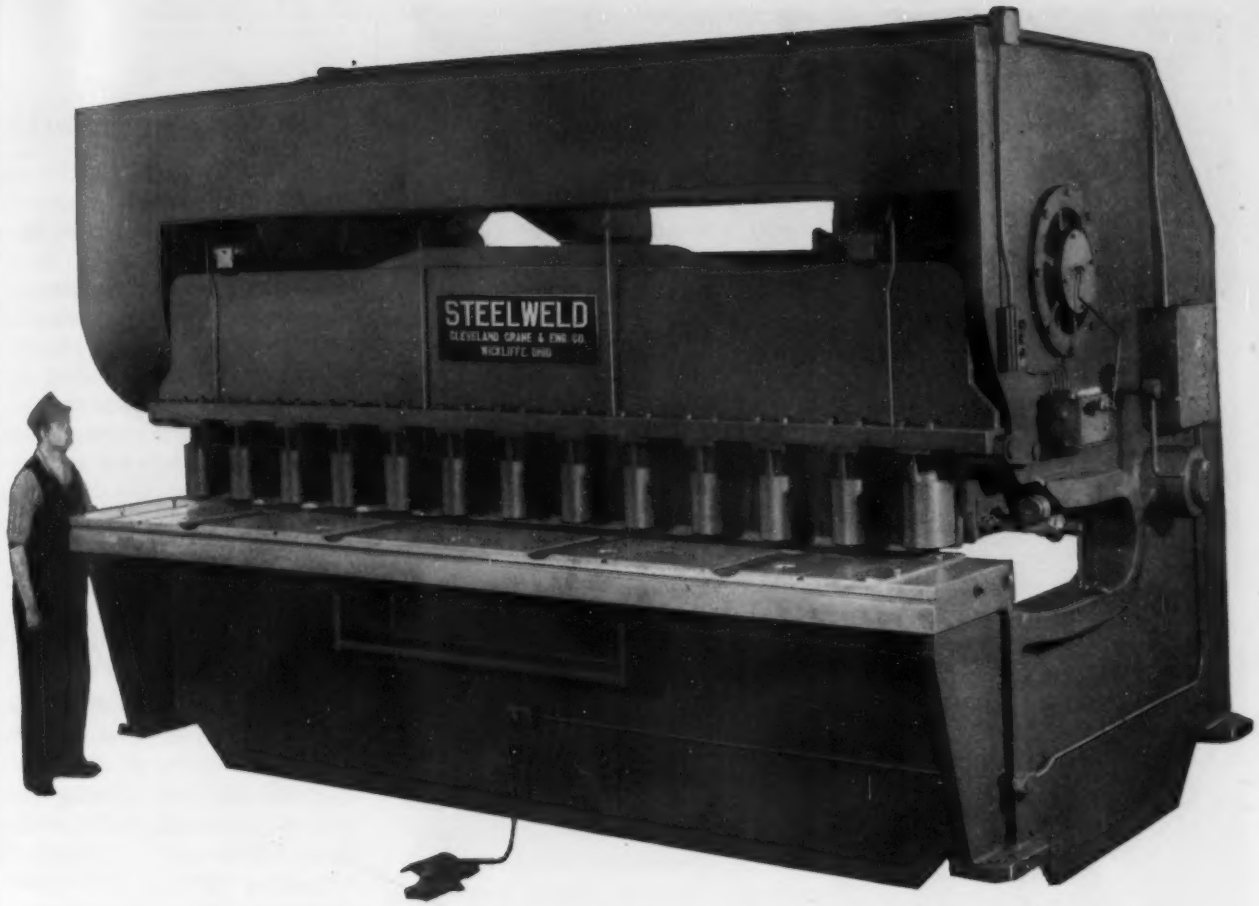


Dust control at low equipment, installation costs

A new cloth-bag collector for dusts such as carbon black, cork, graphite, pigments, lime and metal oxides has simplified design of filter bags and mechanism for reclaiming dust from the bags. Collectors range from 5 to 40 ft long, contain 1360 to 10,880 sq ft of filter cloth, employ from one to six hoppers, and are supplied with appropriate structural supports to furnish the type of disposal desired—wheelbarrow, car, truck. Bags are fastened, open end down, to suspension members. A rubber hem at the open nozzle end insures dust-tight fitting of bags to grid plate. Nozzles are sealed over grid openings in collector floor. Minimum number of parts, simplified design and easy accessibility make it possible to maintain and inspect collector easily and without tools. *Pangborn Corp.*

For more data insert No. 27 on postcard, p. 113

Turn Page



CUTS 12 FEET 3/4 INCH STEEL PLATE

at 30 Strokes Per Minute

SOME FEATURES OF THIS SHEAR

1. Cuts by pivoted-blade principle.
2. Operated by electric foot switch.
3. Knife clearance adjusted by hand crank and dial indicator.
4. 36-inch throat permits slitting wide plate.
5. Lift-up type back gauge on ball bearings.
6. Heavy all-welded one-piece steel frame.

This is one of a complete line of Steelweld Pivoted-Blade Shears that has been developed for cutting plate of all thicknesses from 12 gauge to 1¼-inch plate and for lengths from 6 feet to 18 feet.

Steelweld Shears are radically different from all other shears now on the market. They have features never before possible. The revolutionary pivoted-blade travels in a circular path and overcomes handicaps of ordinary guillotine-type shears.

Not only are these machines easier to operate but their design assures smooth straight cuts to hair-line accuracy for years of operation. Their construction is extra heavy, and all modern features are incorporated to provide for ease of operation, minimum maintenance and long life.

Get the facts on these outstanding machines.

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CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

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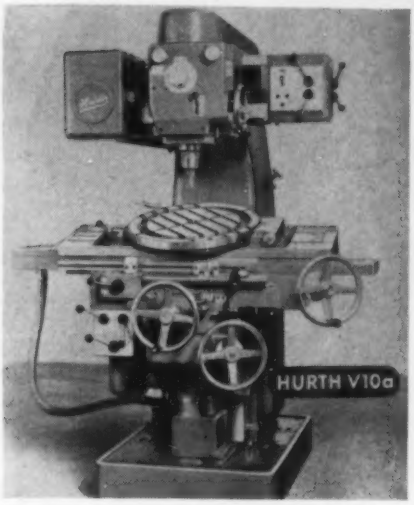
STEELWELD PIVOTED BLADE SHEARS



Milling and jig boring performed on single machine

Vertical milling, downfeed milling and jig boring can be performed with a single machine and a single setup of the work in the German-made Hurth V 10a precision boring and milling machine. Longitudinal traverse of the worktable, which can be tilted 15° in two directions, is used for vertical milling; longitudinal traverse of worktable and graduated downfeed of cutter spindle for downfeed milling. Spindle downfeed can be varied in extremely small steps for jig boring. Thirteen spindle speeds cover the range from 45 to 2800 rpm. Nine boring speeds are available for each of the spindle speeds. Massive construction of the machine practically eliminates distortion. An extremely long spindle quill guided in a precision-bored hole assures precision cutting. Gage block measuring equipment on the worktable enables accurate checking of the work while in position in the machine. The machine can be adapted to long-run production work. *Kurt Orban Co.*

For more data insert No. 28 on postcard, p. 113

Magnification continuous from 1000X to 60,000X

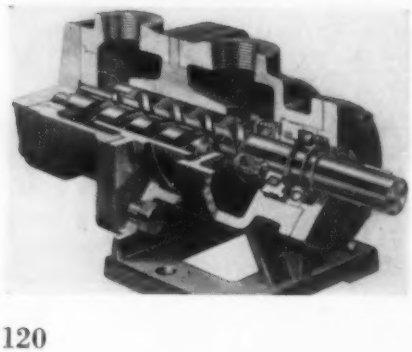
Screen magnification of the new Philips electron microscope is continuous from 1000X to 60,000X and the instrument is capable of producing micrograms of 30 Angstroms resolution or better. A beam oscillator permits rapid determination of exact focus. An extremely large field permits recording in a single photograph, areas which might otherwise require a mosaic of six individual sections. A roll film camera is employed, using 35 mm high contrast film, permitting up to 40 exposures at one loading, and allowing grain-free enlargements to 12X or better. Immediate change-over for electron diffraction patterns of pre-selected portions of the specimen is possible without change of pole pieces, specimen transferral, or other inconveniences. *North American Philips Co., Inc.*

For more data insert No. 29 on postcard, p. 113

Motor control center for two or more ac motors

A new motor control center for use wherever two or more ac motors are controlled from a central location is pre-engineered, factory wired and assembled, and employs many standard components and accessories. It provides a simplified method in installing and servicing in a central location ac combination motor starters in NEMA sizes 1 through 5, as well as lighting panels and associated equipment for a group of motors. The center is designed to withstand short circuit stresses up to 25,000 amp, substantiated by certified laboratory tests. Its sections, each measuring 20 in. deep, 20 in. wide, x 90 in. high, join together to form a strong, free-standing, completely dead-front, NEMA I enclosed, control assembly. Units are installed from front or rear; are designed in even multiples of 14. *General Electric Co.*

For more data insert No. 30 on postcard, p. 113



Low-cost pump for higher pressures

Forty-pct saving in initial cost over other IMO models for similar pressures is claimed for the De Laval-IMO A313B pump. It is a rotary positive displacement pump with only three moving parts. It is reliable, quiet, pulsation-free, compact, excellent for high-speed operation. It can be used for capacities to 80 gpm, pressures to 275 psi and intermittent pressures up to 325 psi. This IMO handles light or viscous fluids in hydraulic systems, oil burners, lubrication. *De Laval Steam Turbine Co.*

For more data insert No. 31 on postcard, p. 113

Lapping compound

Production economies, plus the convenience of ready-mixed lapping compounds that are soluble in water are made possible with abrasive formulations being marketed to manufacturers of brass and bronze plug valves. Compounds are available in four different grades of grit sizes. The suspending medium is soluble in water permitting finished parts and machines to be cleaned with ordinary water and without recourse to solvents or strong alkalis. *U. S. Products Co.*

For more data insert No. 32 on postcard, p. 113

Drum handling arms

Two new lift truck attachments for handling drums are for use with the Hyster load grab attachment. A two-drum arm permits an average rated load of 1990 lb; 2800-lb rated load for four-arm model. They feature a specially-designed, steel-backed, replaceable rubber pad. The rubber has a mechanical and vulcanized bond to the steel backing. Six bolts attach each pad to the arm. *Hyster Co.*

For more data insert No. 33 on postcard, p. 113

Maintenance paint

A new maintenace paint protects metals subjected to temperatures in the range of 200° to 1000°F. Called Thermalite, it gives durable protection in specific high-temperature applications. It is a high-heat aluminum paint that presents a clean, smooth, silver-bright finish; does not discolor, blister, flake or burn off. *Tropical Paint & Oil Co.*

For more data insert No. 34 on postcard, p. 113

Safety connecting links

Chain connections are said to be easy when using the Wedglok universal link. Only two sizes are needed to connect any size chain from ¼ to ¾ in. and they can be assembled anywhere without special equipment. Links are available in sizes up to 3 in. *Interstate Drop Forge Co.*

For more data insert No. 35 on postcard, p. 113

Turn Page

Cut materials handling costs with

MAGCOA Magnesium DOCKBOARDS

Magcoa Magnesium Dockboards are proving the perfect answer to freight car and truck loading problems in every type of industry. One man can position it without the aid of truck, chain or hoist because it weighs ¼ as much as steel ramps of equal size and strength. Hand holds in each corner of the special quarter round safety curb permits ease of handling.

Beveled edges and bend angle keeps Dockboard flush with floor and dock. Slipping out of position is impossible due to safety span designed to application requirements. Put completely modern Magcoa Dockboards to work for you . . . they'll take the load out of your carloading operations.

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MAGNESIUM COMPANY of AMERICA East Chicago, Ind.

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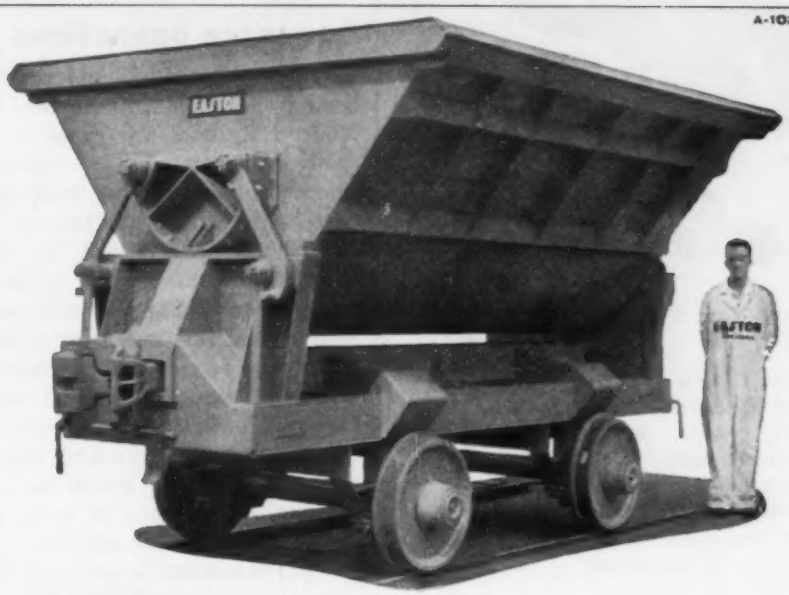

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Will direct operations of Forge Plant, Electric Melt Shop and Heat Treating Department.

•

Must have proven record of 15 years' metallurgical and related experience, of which ten have been line or administrative supervisory experience in steel making and hot metal working companies engaged in:

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Heavy closed die press forging and steam hammer forging

Prefer married man, 38-45, career-minded and desirous of permanent position with long-established, prominent company, planning substantial growth in manufacture of its commercial products.

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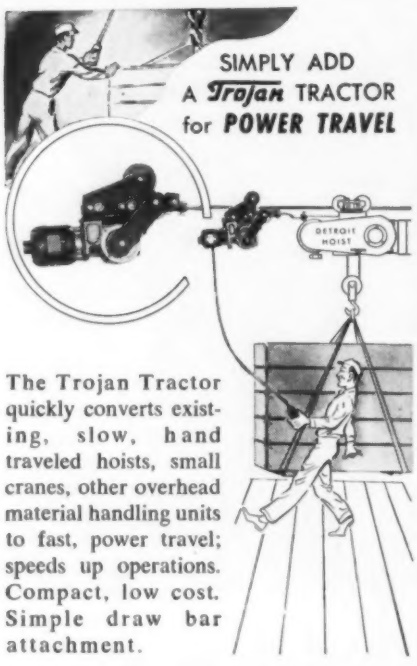

The Trojan Tractor quickly converts existing, slow, hand traveled hoists, small cranes, other overhead material handling units to fast, power travel; speeds up operations. Compact, low cost. Simple draw bar attachment.

Mail this ad or the coupon for more information and Bulletin 810.

DETROIT HOIST & MACHINE CO.
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Company_____

Address_____

—New Equipment—

Continued

Bearing blue

This material is primarily compounded for spotting, scraping and fitting of various machine component parts, such as the scraping and fitting of machine tool mating surfaces. It will not dry and is in ready use for the average shop application. It is packaged in 4-oz cans for shop use; six to a carton. *Dayton Rogers Mfg. Co.*

For more data insert No. 36 on postcard, p. 113

Sight-feed lubricator

Adequate lubrication of tube cleaners and other air or steam-powered tools is assured with a new sight-feed lubricator. It requires no adjustment, no turning on or off. It is actuated entirely by pressure of the operating air or steam, not by flow. As long as pressure is supplied, oil is accurately metered into the operating hose. Rate of oil flow is controlled by a knurled cap on top of the lubricator. *Elliott Co.*

For more data insert No. 37 on postcard, p. 113

Sequence operations

For opposed drilling and counterboring operations in sequence, two Model HH units are wired to operate automatically in sequence. The operator loads the small steel part in the fixture and touches the start button whereupon one unit drills a No. 44 hole and a No. 30 counterbore with a combination tool. When this operation is completed, the second unit comes in from the opposite side and reams part way a No. 38 hole 0.004 in. off the center line of the first drilling and counterboring operation. By varying the position of units and tools employed, the machine can readily be adapted to other drilling operations. *Govro-Nelson Co.*

For more data insert No. 38 on postcard, p. 113

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

CLEANING METALS

fast...

In and out of Metso bath in a minute, metals are chemically clean for plating and other finishing.

Metso Detergents produce vigorous alkaline power balanced with soluble silica, which speeds up cleaning, prevents dirt redeposition and protects metals.

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New Equipment

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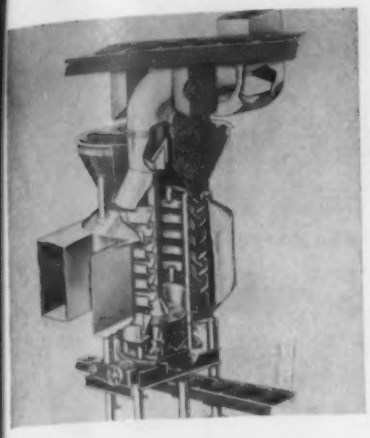

Coal dryer

The Baughman Verti-Vane thermal dryer is a convection dryer with forced draft. Heat source is an ordinary refractory-type coal-fired furnace. An induced-draft fan draws the hot furnace gases from the heat ducts, into the outer gas chamber, and through the circular, zig-zag column of coal, vaporizing the surface moisture and carrying the moisture-laden gases into the center chamber. Then they are drawn through the fan and discharged out the exhaust stack to the atmosphere. *Robert Holmes & Bros., Inc.*

For more data insert No. 39 on postcard, p. 113

Packing glands

Made of 303 stainless steel throughout, new packing glands for general use and ease of installation in process control, pilot plant or laboratory installations accommodate tubes from ⅛ to 13/32 in. (⅛ in. ips) OD at the present. PG-2 and PG-4 have asbestos graphite packing and may be used as small stuffing boxes or to seal static lines, thermocouple wells, dial thermometer stems, or any round tubes or rods. PG-3 employs powdered talc as a sealant and is chemically inert for use at temperatures exceeding 1400°F. Inside diameter of all Conax packing glands are bored to customers' specifications. *Conax Corp.*

For more data insert No. 40 on postcard, p. 113

Turn Page

WHY NOT cast a magnesium mousetrap?

Maybe it IS a lousy idea . . .

On the other hand, maybe it's as practical as using cheese for bait.

Frankly, we haven't gotten out a slide rule or put our thinking cap on tight, to figure it out one way or the other. Maybe the mice wouldn't go for it.

But we do know a lot of things WILL be cast in magnesium or aluminum after military requirements are satisfied.

A lot of things no one ever thought would be.

So whatever your plans are; whatever directions they might take; whatever products you might have on scraps of paper, in preliminary drawings, or just plain ideas-on-the-brain . . . . keep an open mind in terms of magnesium or aluminum in sand-cast, semi-permanent or permanent mold form.

Particularly Well-Cast castings.

Naturally.

Well-Made Wood and Metal Patterns • Ampco Bronze Castings

Almost a half-century of Experience

THE WELLMAN BRONZE & ALUMINUM CO.

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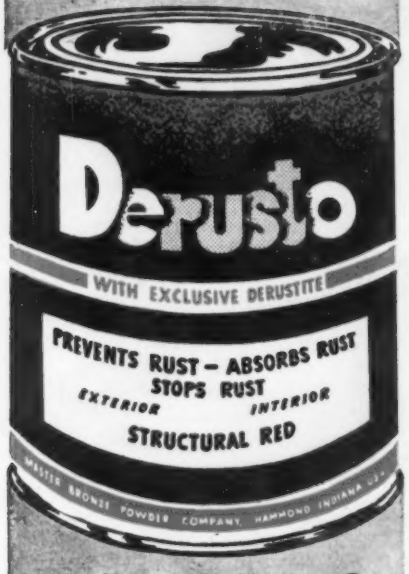
For MAXIMUM PROTECTION on all METAL SURFACES...



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because Derusto

PREVENTS RUST

STOPS RUST

DERUSTO has successfully passed all tests given by the Pittsburgh Testing Laboratory.

DERUSTO comes in standard industrial colors . . . ready for spraying, brushing, or dipping.

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MASTER BRONZE POWDER COMPANY
5009 CALUMET AVE.
HAMMOND, INDIANA

New Equipment

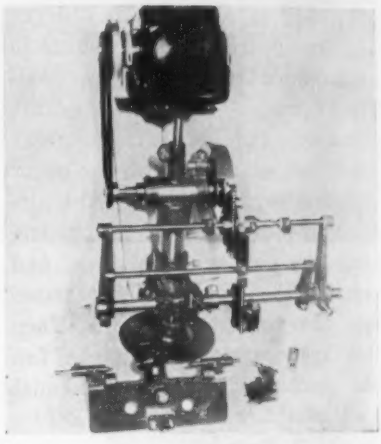
Continued

500 and 1000-lb loads

A new rugged Powerlift is a compact, space saving machine designed to simplify lifting, piling, stacking and trucking. It operates on electric or battery motor. The electric model is driven by a ¼ hp reversing type motor with a drum type controller. Brakes are elevator type and the platform is chain-lifted. The battery model lifts at 18 fpm with fast hydraulic lowering. *Langley Mfg. Co.*

For more data insert No. 41 on postcard, p. 113

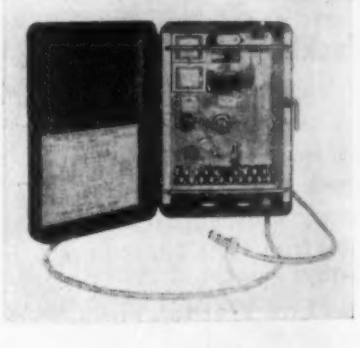
Precision grinder



This tool and cutter grinder is designed to conserve time and labor in small and large shops. It adjusts easily and quickly to handle milling and forming cutters; spiral end mills, taper reamers and various circular cutters up to 5½ in. diam. The machine weighs 100 lb; occupies a space 14x20 in.; may be bench or floor-column mounted. *William Busse Machine Works.*

For more data insert No. 42 on postcard, p. 113

Burner protection



Constant guard against flame failure is provided by a new Fireye photoelectric safeguard. It protects semi-automatic or manually-fired gas, oil, and combination gas/oil burners. When flame fails, Fireye instantly cuts off fuel and can be wired to sound an alarm. *Combustion Control Corp.*

For more data insert No. 43 on postcard, p. 113

Dry photocopies

In less than 30 sec a finished copy of originals in any office can be produced on a new machine that occupies no more space than a typewriter. Anyone without training or special skill can produce clear, black and white photo-exact copies. *American Photocopy Equipment Co.*

For more data insert No. 44 on postcard, p. 113

Crucial Steel Wage Decision Facing Administration

Government leaders must choose . . . Will they hold the line on inflation? . . . Or grant big wage boost in trade for votes? . . . Guess is they will have to give ground to labor.

The steel wage dispute has the Administration in its worst political jam since Korea. At stake is its whole anti-inflation program, with its wage and price ceilings. The question is: Shall steelworkers be denied a substantial wage increase which would threaten loss of millions of votes next November, or will the line be held against inflation? Decision must come soon from the top level.

There is no meeting of minds on this question at top government level. Mobilizer Wilson and the President have expressed strong ideas on how far to go in allowing steel wage increases. Leon Keyserling, top government economist, has said he is not in favor of granting what union president Phil Murray wants.

Tight Squeeze—Here are the factors which must be weighed in making this crucial decision:

(1) Mr. Wilson is dead set against granting the steelworkers more than the Wage Stabilization Board formula allows. At best, this would amount to about 7¢ an hr—a figure Mr. Murray regards with disdain.

(2) Mr. Wilson is equally opposed to a round of price increases. And Economic Stabilizer Putnam has gone out of his way to stress that the steel companies have no assurance of a price increase to offset higher wages. To steel companies that means an impasse.

(3) Mr. Wilson is ready to stake his job on holding the inflation dike. He has said so privately in no uncertain terms.

Stretching Formula—(4) Top Administration leaders must make a decision quickly. Will they allow the steelworkers a healthy pay raise in return for their political support? Or will they really fight inflation by holding the line on steel wages and prices within formula limits? The guess is that they will be forced to give ground to hold the labor vote next fall.

(5) Under the present formula, WSB can permit an increase of only about 7¢ per hr. But an additional 3½¢ might be called "inequity in wage structure." Then they might stretch their conscience and debate another 4¢ raise for "productivity." This shows the possibility of a 14½¢ raise for steelworkers. That figure is pretty close to Mr. Murray's agreement point—if he can get the union shop thrown in. Industry and union guesses on the final wage settlement run from 14 to 16¢ an hr.

Prices, Too—(6) If steelworkers get anything like 16¢ an hr, a steel price rise is sure. The industry can prove cumulative cost increases amounting to more than $4 a ton. A wage increase would mean that sooner or later the industry will show cost inflation of a bare minimum of $10 a ton. But the hitch is that realists know the government will drag its feet over any steel price increase over $6 or $7 a ton. It has done so in the past, leaving steelmakers in the lurch.

The Administration finds itself in the most untenable position of recent years. If it allows a big wage boost it will set off a cannon cracker that will blow the formula lid clear off and spread the sixth round to all other fields. If it does that, it must grant a price increase, too, and together they will feed the inflationary fire. If steelworkers get an increase, so will white collar workers.

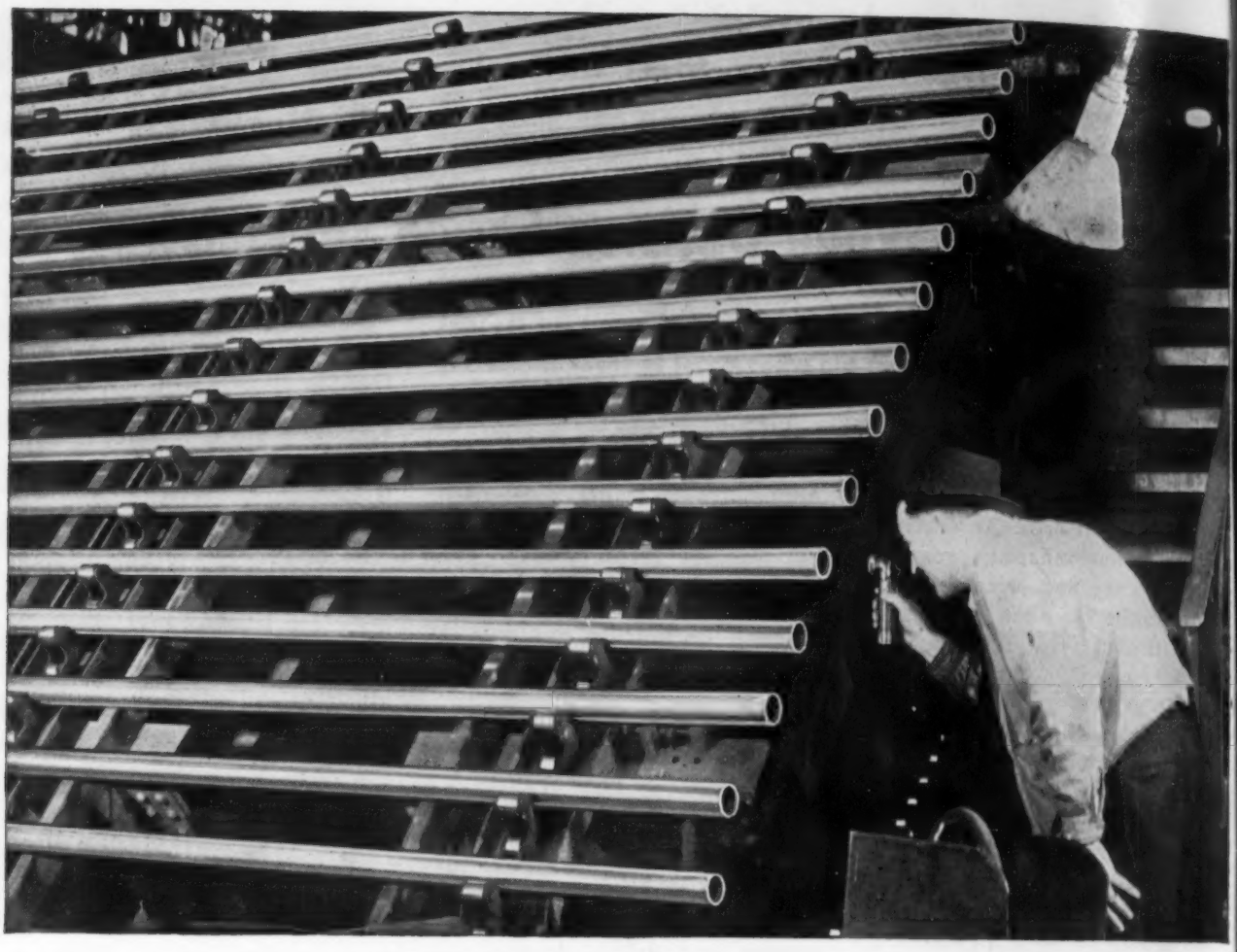
Some Products Ease—As mills book second quarter orders, signs of easing on some steel products are becoming more concrete. Steel people are confident they can sell all of second quarter output, but not without more effort on certain products. Here are some signs:

Several mills are boosting second quarter quotas of cold-rolled sheets to customers. Some customers eagerly take bonus tonnage; others don't seem anxious. Consumers will have little trouble booking CMP tickets on these during second quarter.

Warehouses are cutting down purchases of seconds and wasters. They're also watching inventories closer, shaving some products to get into balance.

Limiting Factors—Cold-rolled strip is more readily available. Several sources report customers in farm equipment and railroad fields reducing orders for second quarter. Mechanical tubing is also easier, has been for some time. Some furniture makers and parts vendors are near inventory violation due to enforced production cutbacks.

In Detroit pressure for steel has collapsed following news of the latest Washington cutback on autos. Enough steel is allowed for 930,000 cars a quarter, but only enough aluminum and copper for 800,000 cars. Except for special types, which are still short, steel supply is becoming almost academic. Some have flat-rolled inventories close to legal limits.



SPECIALIZATION GIVES YOU UNIFORM HIGH QUALITY IN

GLOBE ALLOY STEEL TUBES

When you specify GLOBE you get the finest, because Globe *specializes* in the production of steel tubes. For more than thirty years Globe *specialized* research, engineering and manufacturing facilities have assured customers of uniform high quality in alloy steel tubes for pressure or mechanical applications.

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Chicago • Cleveland • Detroit • New York • Philadelphia
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Producers of Globe seamless stainless steel tubes — Gloweld welded stainless steel tubes — alloy — carbon — seamless steel tubes — Globeiron (high purity ingot iron) seamless tubes — Globe Welding Fittings.

TYPICAL ANALYSES:

Carbon Moly.
1-¼ Chrome ½ Moly • 1-¾ Chrome ¾ Moly
2 Chrome ½ Moly • 2-¼ Chrome 1 Moly
5 Chrome ½ Moly • 7 Chrome ½ Moly
9 Chrome 1 Moly
A1S1 1335 • A1S1 2317 • A1S1 2512 •
A1S1 4130, 4140 • A1S1 4615 • A1S1 8615, 8620, 8630, 8635, 8640 • 7% Ni. • 9% Ni.

TYPICAL APPLICATIONS

Pressure Tubes — Superheater Tubes — Condenser Tubes — Still Tubes — Evaporator Tubes — Barrel Tubes — Oil-Well Pump Barrels — Mechanical Tubes — Aircraft Tubes—Rollers for Transmission Chains

GLOBE SEAMLESS TUBES FOR MAXIMUM STRENGTH AND MINIMUM WEIGHT

Pierced from solid steel billets . . . with no seams or welds, Globe seamless tubes are available in many sizes and wall thicknesses for exacting applications.

Market Briefs

new strikes—Two metalworking plants in Birmingham were idled last week by strikes of members of the United Steelworkers of America (CIO), who set up picket lines. The union announced the strikes, against the Southern Amiesite Asphalt Co. and Sherwood-Moore Iron Works, were called after both companies had discharged workers for union activities. Union officials said the firings in both cases followed notification to the companies that employees had asked the USW to represent them in collective bargaining.

steel production—Canadian production of steel ingots and castings for November, 1951 was 307,075 net tons, a daily operating rate of 94.9 pct. This compares with 309,414 tons or 92.5 pct for the preceding month and with 289,488 tons or 88.5 pct for November, 1950. Output included 295,485 tons of steel ingots and 11,590 tons of steel castings. In the 11 months ending with November cumulative production of steel ingots and castings totaled 3,270,716 net tons, a new record.

price rise — International Harvester Co. last week announced price increases for most of its farm implement, farm tractor and industrial power products, effective Jan. 2. Increases were made in accordance with the applicable Office of Price Stabilization price regulations. Most farm implements were increased 2.61 pct while farm tractors and industrial power products went up 2.5 pct.

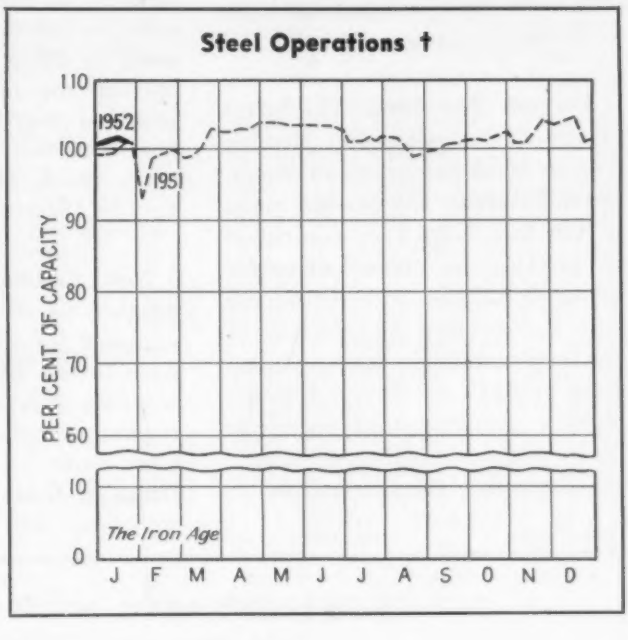
scrap source—Two ship salvage concerns have asked the Army Corps of Engineers for permission to scrap the old battleship Massachusetts, purposely sunk offshore from Pensacola, Fla., in the early 1920s. Part of the ship protrudes from the water and for a time was used for an artillery target. The salvage companies, Pinto Island Metal Works, Mobile, and Massey Salvage Co., Pensacola, said they expected to get a large amount of scrap badly needed from the operation.

allocations — First quarter 1952 free-world production of tungsten and molybdenum, estimated by International Materials Conference to be 3700 and 4800 metric tons, respectively, has been allocated provisionally. The U. S., as has been customary in conference operations, is the largest beneficiary and largest user. This country is in line for 1748 tons of tungsten ores and concentrates, and 3644 tons of molybdenum.

steelmaking abroad— Steel capacity increase for Free World European producers this year will amount to 25 pct of present figures, reports Col. Robert A. Solborg, of Armco Steel's European export division. German steel will show a swift capacity rise. American productivity and efficiency will permit it to build up a sound market export trade once again in the face of growing European steel. Earl A. Emerson, president of Armco International, revealed that Japan's steel industry had been given a boost by fighting in Korea and that the country was supplying steel to American armed forces.

big contract—Orinoco Mining Co. has awarded general contract for construction of Cerro Bolivar mining project in Venezuela to Constructora Bechtel, S. A. The South American affiliate of Bechtel Corp. will supervise, direct and engineer construction of mine facilities, a 90-mile railroad and highway from mine to port, port and ore loading facilities including power plants, materials handling, housing, water and sewer systems. Construction will begin at once.

appliance outlook — Under present materials allocations, the electrical appliance industry will manufacture about 80 pct of its 1951 output during the coming year, according to James J. Nance, president of Hotpoint, Inc.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Jan. 6	97.0	101.5	102.0	101.0	103.0	104.0	97.5*	105.0*	105.0	104.0	96.5	91.5	113.5	102.
Jan. 13	96.0	102.5	102.0	101.0	95.0	104.0	99.5	106.0	102.0	104.0	96.0	76.0	94.0	101.5

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.
* Revised.

Set New U.S.-U.K. Metal Swap

U. S. to supply Britain with steel; to get aluminum from Canada, Tin from Malaya . . . Aluminum to be repaid . . . World zinc and lead markets softening — *By R. L. Hatschek.*

American steel is to be swapped for Canadian aluminum and Malayan tin, according to reports from Washington. Complete details had not been divulged but were expected shortly as we went to press. Original announcement placed the quantities at: Steel, 1,000,000 tons; aluminum, 25,000 tons; and tin, 20,000 tons. The totals include the earlier exchange for 11,000 tons of aluminum. Delivery is set for 1952 but actual dates are not known.

The aluminum is to be repaid to the British when new facilities boost production in this country. The tin is to be priced at $1.18 per lb, higher than Reconstruction Finance Corp.'s offered $1.12 but well below the Bolivian asking price of $1.50.

Foreign Tin Rises—The effect of the Truman-Churchill meeting was to boost tin prices in Singapore. Saturday the market stood at the c.i.f. New York equivalent of $1.21⅛, the highest price for about 2 months. Also bolstering this market was confirmation of Stuart Symington's resignation as head of RFC. Mr. Symington will remain in office until Harry A. McDonald's nomination is okayed by Congress. He is reported to hold the same views on tin pricing as Mr. Symington.

Zinc, Lead Soften—Though zinc and lead supplies are still critical in this country, there have been definite signs of softening in foreign markets for these metals. Some reports are heard of sales of foreign lead to U. S. buyers at the current ceiling of 19¢ per lb and others tell of offerings at the same figure. This is only a short time after some foreign producers refused to sell at the U. S. ceiling. To a lesser extent the same is happening in zinc.

Some lead consumers in this country are holding off in anticipation of Congressional action to remove the import tariff. Presumably the tax suspension would remain in effect until 1953 or the end of the national emergency, provided that the domestic price does not fall below some arbitrary figure. This floor will probably be 18¢ per lb.

New Ceilings Coming — Price regulations of specific nature are expected for zinc and lead in the near future. Office of Price Stabilization will then make moves toward complete elimination of price controls on ores and concentrates of these metals. A similar specific price order on copper is also expected, though it is not as certain as the others. Platinum is also slated for a price order within a very short time.

Bauxite Supplement—Shipments of bauxite from Jamaica deposits of Reynolds Metals Co. will start early this fall. Actual starting date depends on when a self-loading ore carrier is delivered. These deposits will be the source of some 550,000 tons of the aluminum ore and will bolster supplies originating in Arkansas rather than supplanting them.

Despite ever-growing aluminum production (Kaiser Aluminum & Chemical Co. has already shipped the millionth pound of aluminum from the new Chalmette reduction plant), primary aluminum producers have suggested that National Production Authority recommend withdrawal of substantial tonnages of aluminum from the strategic stockpile. A withdrawal of 10,000 tons had already been okayed. The producers also urged NPA to facilitate the purchase of foreign aluminum for short-term delivery.

NPA to Cut Backlog—At the present rate of growth, the backlog of unfilled orders for aluminum and aluminum products threatens to hit 95,000 tons by the end of the second quarter. NPA plans to further reduce allotments in order to keep this backlog from exceeding 35,000 tons by Sept. 30. The New Year began with an aluminum backlog of 45,000 tons.

Existing shortages, according to NPA, are almost totally confined to ingot for foundry and destructive uses. Proposed changes in order M-5 include (1) a change in the method of authorization of production schedules, (2) prohibition of conversion of pig or ingot into aluminum products without NPA okay, and (3) prohibition of scheduling aluminum production for which suppliers have no authorized controlled material order.

NONFERROUS METAL PRICES

	Jan. 9	Jan. 10	Jan. 11	Jan. 12	Jan. 14	Jan. 15
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.03	$1.03	01.03	....	$1.03	$1.03
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, *f.o.b. ship. pt. frt. allowed*)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.6¢; 52S, 35.6¢; 24S-O, 24S-OAL, 38.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 33.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 33.3¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 28, 39.5¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 39.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 64¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ⅜ to ⅝ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ⅝ in. diam, 10,000 lb; ⅝ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb, ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76; 0.165 to 0.219, ⅞ to 3¼, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb.; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	50.00
Beryllium copper, 3.75-4.25% Be	1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$59.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium dollars per troy oz.	$200
Lead, St. Louis	18.80
Lead, New York	19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$208 to $211
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	88.00
Tin, New York	$1.03
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.20
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	32.25
No. 315	30.25
88-10-2 ingot	
No. 210	40.00
No. 215	38.50
No. 245	33.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.00
Grade 2—92-95%	17.75
Grade 3—90-92%	17.25
Grade 4—85-90%	16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.34
Electrodeposited	33⅜
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34⅜
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19½	17⅞
Red brass	20½	19¾
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Maker's Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¾—17⅞
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14¾
No. 1 composition	18 —18½
No. 1 composition turnings	17¾—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	10 —11

Zinc

New zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	15¾—16
Battery plates (dry)	10 —10½
Batteries, acid free	7 — 7¼

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	85 —90
No. 1 pewter	60 —65
No. 1 auto babbitt	48 —50
Mixed common babbitt	16¼—16½
Solder joints	21 —22
Siphon tops	48 —50
Small foundry type	21 —22
Monotype	18½—19
Lino. and stereotype	17½—18
Electrotype	16 —16½
Hand picked type shells	10 —11
Lino. and stero. dross	8¾— 9
Electro. dross	7½— 8

Milder Weather Lends Scrap a Hand

Prompts cautious optimism at scrap convention in New York . . . Some scrap men feel that barring heavy attack of winter not much shutdown trouble will hit . . . Industrial scrap slips.

Kinder weather joined the scrap man's battle to furnish enough scrap so that openhearth shutdowns would be kept to a negligible minimum. Cautious optimism was prompted by the balmy winter weather that was a welcome atmosphere for the 24th annual Institute of Scrap Iron & Steel convention being held in New York.

Having overcome so many obstacles to scrap collection and refuted so many pessimists in gathering up and shipping 34 million gross tons of scrap in 1951, the scrap man attending the convention was charged with confidence.

For scrap industry's convention coverage see p. 50, News of Industry section.

In back of him was an impossible job made possible. Some scrap men cautiously predicted that scrap collections would see the steel industry through these lean months.

Scrap metal in the main trouble center, Pittsburgh, continued to be in very short supply. Good weather was the reason for optimism. Early this week the five openhearths shut down by U. S. Steel for lack of scrap were still out. Chicago shipments appeared to be quickening under the stimulus of easier climate. And in Philadelphia no immediate danger of shutdowns was hanging over the trade's head.

Now that winter has pulled in its fangs temporarily, the fall of industrial scrap shipments remains as the prime bogie. As the Scrap Institute's Ed Barringer put it: "The fall of prompt industrial scrap receipts is no fault of the scrap industry."

Detroit reported scrap movement as the slowest of many weeks. Chicago had similar news. Many scrap men attribute the drop of industrial scrap shipments to cutbacks, changing over to defense production. A minor reason is probably because some steel products are hiding out in defense producers' inventories while war work is delayed. This disturbs the scrap generation cycle.

Pittsburgh — Supplies continued tight in the district but some steel producers took hope with arrival of good weather. U. S. Steel Corp. early this week still had five furnaces down to conserve scrap. Shipping notices to one consumer picked up late last week. Pittsburgh Steel Co., which has been operating at 50 pct of capacity during installation of a blooming mill in the last 30 days, planned to increase its operating rate this week, promising additional strain on supplies in this area.

Chicago — Scrap shipments are slightly improved with milder weather. One major producer continues to have three openhearths down. A dropoff in supplies of industrial scrap has been noted for several weeks. A defense production increase in coming months should generate more scrap. Except for No. 1 material, cast continues to be extremely weak. The turnings market remains quiet.

Philadelphia—The scrap trade sees no immediate danger of shutting down openhearths in this district because of the scrap shortage. But mills are still on thin ice with average stockpiles estimated at 7 to 10 days. One small producer may have hit the inventory limit for he is reported to have halted shipments last week. Dealers are still blanketed with old allocations and expect to receive more.

New York—Spotlight this week is on the 24th annual scrap convention being held in the Hotel Waldorf-Astoria, here. General mood of confidence prevails with members preparing another scrap collection splurge to meet new scrap goal of up to 38 million tons for 1952. New York movement of scrap showed a few signs of picking up. Fine weather may encourage peddlers to take to the field more vigorously.

Detroit—Scrap movements here are very slow. Some sources report the leanest movement in many weeks. Declining auto output, inventory-taking, model changes and snow have combined to reduce scrap deliveries. A dealer-allocation of 750 tons to the Pennsylvania area is reported this week.

Cleveland—More mills are filling out openhearth charges with cast because of lack of other grades. Feeling is that local scrap conditions will shut down openhearths here if allocations draw supplies into other critical areas. Late reports indicate some scrap has already been diverted with local openhearth operators digging into inventories. Unstripped motor blocks are now being offered to help out but lack of stripping facilities prevents use.

St. Louis—Mills here are still eating into inventory but the scrap movement was accelerating the slightest bit. Any improvement may be credited to better weather.

Birmingham — Scrap yards here show first signs of having an oversupply of cast scrap. It's due principally to soil pipe plants operating only 2 or 3 days a week. A little heavy melting has come into the district the past week but not enough to meet demands. Dealers expect a scrap drive just getting under way in the city to begin to show results shortly.

Cincinnati—Although receipts of local industrial production scrap are not high at Newport, Ky., or Middletown, Ohio, it is the only scrap received regularly. Shipments from some southern sources have fallen off at Middletown. Both Armco and Newport Steel are seeing stockpiles diminish. Some reports of openhearths down for repairs are also attributed to lack of scrap. Steel foundry grades remain tight.

Boston—The rush of activity continues here, and, according to dealers, the shortage of materials is not so pronounced as in other sections.

Buffalo—Collections improved with milder weather. Local material is being allocated to local mills.

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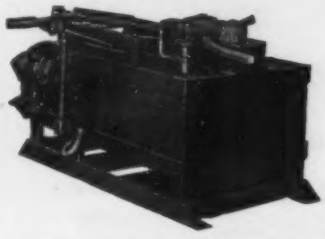

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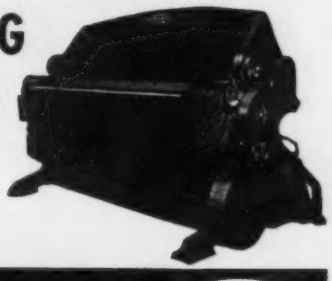
STEEL HAND AND POWER

CHICAGO **BENDING BRAKES**



For Single and Quantity Runs Bending Steel Plate and Sheet Metal

Special Bending Brakes

Double Folder Brakes

DREIS & KRUMP MANUFACTURING COMPANY

CHICAGO

7430 S. Loomis Blvd., Chicago 36, Ill.

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THE MODERN TIN PLATE

LA BELLE CUT NAILS

WHEELING STEEL CORPORATION

WHEELING, WEST VIRGINIA

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
Ingersoll Rand 33" x 20½" x 24". Complete with 635 H.P. G.E. Syn. Motor 2300/3/60
2873 cu. ft. Worthington 29" x 21" & 18½" x 21". Complete with Elec. Equipment

BAR TURNING MACHINES
2½" Medart Type HF-2 Bar Turning Machine
6" Medart Type RFG-6 Bar Turning Machine

BENDER
Parker Model D848 Tube Bender, Motor Driven Capacity 3" O.D. Light Gauge Steel, Aluminum or Copper Tubing. Motor Dr. Mandrel Extractor

BENDING ROLL
No. 6 Hilles & Jones Pyramid Type Plate Bending Roll, Capacity 16' x ¾" Plate Complete with Electrical Equipment

BULLDOZER
#9 William White Bulldozer, Motor Driven With 50 H.P. Motor

CRANE—GANTRY
5 ton Whiting Two Leg Gantry 52" Span, Three Motors 220/3/60, Cab Control

CRANE—TROLLEY
40 Ton Shaw-Box Trolley, Equipped with 15 H.P. G.E. Motor. Gauge of Trolley 7'6". Lift 80'. New 1942

FLANGING MACHINES
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment and numerous dies
No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10' or 12' dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump

FORGING MACHINE
2" AJAX Upsetting and Forging Machine

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little used.
15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated. Complete with Transformer Equipment

PLANERS
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

PRESS—HYDRAULIC FORGING
1000 Ton United Steam Hydraulic Forging Press Quick Acting Stroke (Daylight) 4', Distance Between Columns FtoB 31", RtoL 72" Intensifier and Accumulator Included, also 8000 lb. Alliance Straight Line Manipulator. NEW 1942

PRESS—HYDRAULIC WHEEL
100 ton Elmes Inclined Hydraulic Wheel Press, 72" Between Parallel Bars, Complete with Pump & Motor

ROLLING MILLS
12½" x 16" Phiadelphia Two High Cold Rolling Mill, Complete with Pinion Stand, 75 H.P. Motor 440/3/60, Starter and Controls, Incl. Coiler
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

STRAIGHTENERS
No. 6 Kane & Roach 8-Roll Bar, Angle & Shape Straightener, Motor Driven. Capacity 5 x 5 x ⅝" Angles, 6" x 1" Flats, 2¾" Square, etc.
No. 4 Kane & Roach 8-Roll Bar, Angle & Shape Straightener, Belt Driven. Capacity 3 x 3 x ⅜" Angles, ¾ x 2½" Flats, 2" Square, etc.
7-Roll DECo Shape Straightener, Arr. Geared Motor Drive. Capacity ¾ x ¾ x ⅛" to 1½ x 1½ x 3/16" Angles, ⅜ x 3" Flats, also bars, channels, beams, etc.

TESTING MACHINES
10,000# Olsen Universal Wire Testing Machine
20,000# Southwark S10C Universal Hydr. Testing Machine
120,000 lb. SOUTHWARK-TATE-EMERY Universal Hydraulic Testing Machine LATE
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

WELDERS
700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide
40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation

RITTERBUSH & COMPANY INC.
50 Church Street, New York 8, N. Y.
Phone—Cort 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

OPS Is Silent—With Office of Price Stabilization continuing its closed-mouth policy on pending controls changes, efforts to discover the nature of modifications to CPR 80, establishing ceiling prices for used machine tools, have thus far been snubbed.

Last week OPS warily admitted to THE IRON AGE that an amendment to CPR 80 is under consideration in the machinery branch but would set no effective date for its application.

Asked what were its plans for controversial rebuilding standards, OPS said that they are "about okay" as they now stand. OPS possibly gave away one of the secret amendments to CPR 80 when it was asked the status of the much-desired price book on new machine tools. The trade has been laying heavy stress on the need for new tool price information on which to base used prices.

Price Book—OPS said issuance of the price book is being delayed pending possible establishment of a new base date. The base date of CPR 80 now is Jan. 25. Many dealers have claimed that since new machine tools have been permitted price rises since then, a Jan. 25 base was artificial and unfair.

Holding up the price book for the reason given by OPS indicates that the agency is giving strong consideration to setting of a new base.

Not Up-to-Date—The price book will not conform to a new base date. It would go back to Jan. 25. But dealers say this is better than casting out in the dark.

Some system would be established whereby used dealers could add 5 or 10 pct to price book listings to arrive at a foundation for CPR 80 prices.

Used machine tool dealers have been having difficulty in obtaining prices of new tools from their producers. Inquiries have received belated replies from new producers and in some cases used dealers have been asked to pay a fee for clerical work.

In some cases new tool makers claimed they were unable to supply needed prices because their tools were specially engineered for the job. While used dealers were sympathetic to added clerical chores imposed on new tool producers, they do not feel that their compliance with an OPS order should become a financial burden.

The New York market shows some signs of quickening a little. Inquiries are coming out of hiding in strong number but unfortunately there is not a favorable amount of successful conclusions.

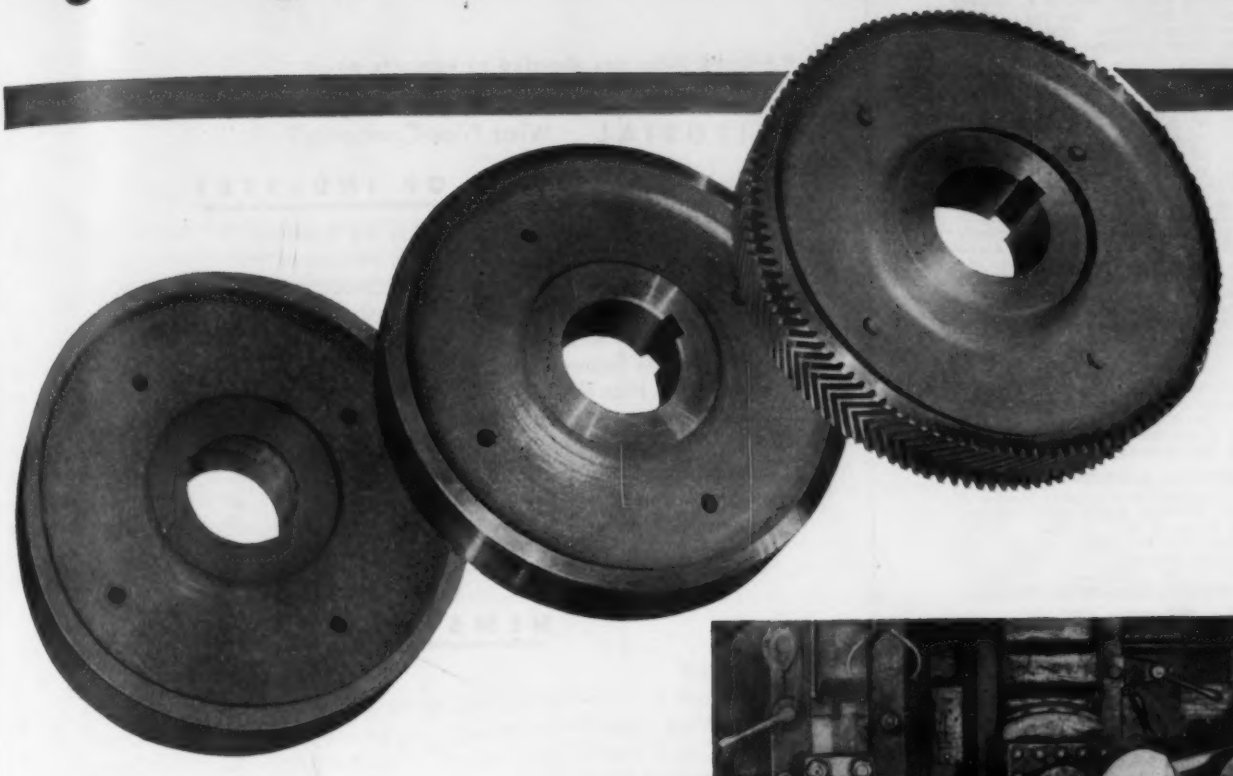
Hesitancy?—One dealer says this may be the result of New Year hesitancy on the part of manufacturers just trying out their new budgets. Another important factor may be coming cutbacks and uncertainty of defense contracts that are serving as restraints on plant buying.

New machine tool imports from Europe are described as increasing. Meanwhile the used machinery market abroad is played out and does not offer much opportunity for substantial imports into America. When equipment is offered by a European dealer the price is absurd and unrealistic as far as U. S. ceiling price controls are concerned.

Need Help—To date there has been no answer to the problem of a labor shortage in the rebuilding program. Skilled labor as required by the trade cannot be newly trained machinists. They must be men skilled in the art of rebuilding, capable of using any piece of equipment in the shop.

This is the type of craftsman that is becoming more difficult to find. Rebuilders everywhere are beating bushes to find first-rate mechanics. Some shops have established training programs hoping that by such measures they will catch up with backlogs.

A good gear is first a good blank



We're mighty careful about the gear blanks we make. As we see it, they've *got* to be good . . . for a strong, sturdy gear is first of all a strong, sturdy blank.

You'll find that Bethlehem's circular steel blanks are trustworthy products. They have uniform density, good grain structure, and homogeneity. These are qualities of high value—especially during machining operations. With Bethlehem blanks, your machinist can work swiftly and confidently, knowing that every cut, shallow or deep, will be made through clean, firm, solid metal.

Bethlehem blanks are made in a mill that first upsets the hot blocks of steel, then rolls and forges in a single operation. This sets up the most desirable grain flow and makes the products ideal for spur, bevel, miter, and herringbone gears.

In size, these strong steel blanks range from approximately 10 to 42 in. OD. They can be purchased heat-treated or untreated, as desired. Write today for Booklet 216, which contains many more details you'd like to know . . . and nearly 100 pictures showing applications and steps of manufacture.

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